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THE VIVISECTION QUESTION

BY

ALBERT LEFFINGWELL, M.D.

SECOND EDITION.

THE VIVISECTION REFORM SOCIETY
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PREFACE.

The present work consists mainly of reprints of essays and criticisms pertaining to a subject of perennial controversy. A few years ago it occurred to me that my personal acquaintance with vivisection, both in this country and in Europe, justified an effort to reconcile certain opposing views. The opening essay in this volume embodied that attempt, and everything written since has been based upon the same endeavor.

I wish that the purport of this book were less certain to be misstated or misjudged, and principally by critics who have no excuse for such misjudgment. Of those who glance at the title, many will doubtless conclude without further examination, that it is written from the standpoint of antivivisection or of antipathy to all scientific investigation upon living creatures. On the contrary, I think a distinct line may be drawn, separating what may be permitted from that which ought to be condemned. The entire abolition of animal experimentation, I cannot conceive as possible of present realization, or until an age dawns when all sacrifice of animal life for food or raiment shall be equally abhorrent to civilization. When a writer asserts—as in an article before me,—that "vivisection is the most atrocious of crimes," what meaning, I wonder, does he attach to his words? If all scientific experiments upon living animals are understood, how it is possible to regard as "an atrocious crime," the hypnotization of a lizard or a fowl, or

the demonstration under a microscope of the circulation of blood in the webbed foot of a living frog? Such writers simply confound the abuses of the practice with the practice as a whole.

But these abuses are beyond question. No words can exaggerate either their cruelty or their malign influence. What I have advocated therefore in this volume *is the prevention of abuse by legal regulation.* This position may be stated as follows:

I. By "Vivisection" is meant experimentation of any kind, painful or painless, made upon a living creature for an alleged scientific purpose.

II. Within certain limitations and to a certain extent, the utility of animal experimentation makes it justifiable and right.

III. The abuses to which the practice is liable are so great, that vivisection should be regulated by law, and placed under the control and supervision of the State.

In order to prove need of the legal regulation here advocated, it has been necessary to refer to cruelties and abuses, incident to the practice as now carried on. The revelation of these has induced criticism; but I cannot see how otherwise, there could be adduced any proof of necessity for legal control.

In one respect, the task made necessary by controversy on this subject has been exceedingly distasteful. It is by no means a pleasant literary employment to point out the inaccuracies or to demonstrate the blunders made by men of national repute in their opposition to the regulation of experimentation. But no fact is more clearly apparent than that too eager laudation of vivisection without control has evoked a carelessness of statement,

or a disregard for accuracy, utterly opposed to the interests of scientific truth. And it is truth, and truth only that we ask for, as concerns vivisection or anything else. "Truth," cried Carlyle, "though the Heavens crush me for following her; no Falsehood, though a whole celestial Lubberland were the price of apostacy!"

The references to various scientific authorities have been made with extreme care and are believed to be absolutely correct. In reprinting several of these articles the opportunity for revision has been freely used.

It only remains to thank the conductors of various periodicals for permission to use articles which wholly or in part first appeared in their pages.

A. L.

Brooklyn, 1901.

CONTENTS.

		Page
I.	The Vivisection Question	1
II.	Certain Dangers of Vivisection	20
III.	Concerning a Prize Essay	37
IV.	Vivisection in America	42
V.	The Restriction of Vivisection	69
VI.	An Ethical Basis for Humanity	73
VII.	Physiology in Our Public Schools	85
VIII.	A Dangerous Ideal	91
IX.	State Supervision of Vivisection	97
X.	Does Vivisection Need Concealment?	106
XI.	Does Science Need Secrecy?	112
XII.	Some Mistakes of Scientists	134
XIII.	Is Science Advanced by Deceit?	152
XIV.	The Value of Life and Truth	184
XV.	The Regulation of Vivisection	191
XVI.	Some Lessons of Great Reforms	204
XVII.	Appendix.	
	1. Reply to Professor H. C. Wood (*Boston Medical and Surgical Journal.*)	236
	2. The Vivisection Controversy (*Philadelphia Medical News.*)	239
	3. Abuses of Vivisection (*The Boston Transcript.*)	241

Page

4. Shall Vivisection be Restricted? 243
(*Popular Science Monthly.*)

5. The Bill Regulating Vivisection 245
(*Philadelphia Medical News.*)

6. Dr. Salmon's Criticisms 246
(*Philadelphia Medical News.*)

7. The Vivisection of Man 248
(*Boston Transcript.*)

8. Human Vivisection 250
(*Boston Transcript.*)

9. Again the Vivisection Question 251
(*Philadelphia Medical Journal.*)

10. A New Method of Criticism 253
(*Boston Medical and Surgical Journal.*)

11. Correspondence with Professor Graham Lusk... 255
(*On properties of Morphia.*)

12. Legislation on Vivisection 258
(*Outline of Bill Proposed.*)

*THE VIVISECTION QUESTION.**

The question of vivisection is again pushing itself to the front. A distinguished American physiologist has lately come forward in defense of the French experimenter, Magendie, and, parenthetically, of his methods of investigation in the study of vital phenomena. On the other hand, the Society for the Prevention of Cruelty to Animals made an unsuccessful attempt in the New York Legislature last winter, to secure the passage of a law which would entirely abolish the practice as now in vogue in our medical schools, or cause it to be secretly carried on, in defiance of legal enactments. In support of this bill it was claimed that physiologists, for the sake of "demonstrating to medical students certain physiological phenomena connected with the functions of life, are constantly and habitually in the practice of cutting up alive, torturing and tormenting divers of the unoffending brute creation to illustrate their theories and lectures, but without any practical or beneficial result either to themselves or to the students, which practice is demoralizing to both, and engenders in the future medical practitioners a want of humanity and sympathy for physical pain and suffering." Perhaps these assertions go a little too far. Let us endeavor to study the whole question dispassionately, and see how it thus appears.

Leaving out the animal world, there are three parties interested in this discussion. In the first place, there are

*The following essay appeared in SCRIBNER'S MONTHLY for July, 1880, under a question prefixed by the editor of the magazine: "*Does Vivisection Pay?*" As this does not quite fairly represent the writer's position in regard to vivisection, the original title is here given.

the professors and teachers of physiology in the medical colleges. Naturally, these desire no interference with either their work or their methods. They claim that were the knowledge acquired by experiments upon living organisms swept out of existence, in many respects the science of physiology would be little more than guesswork to-day. The subject of vivisection, they declare, is one which does not concern the general public, but belongs exclusively to scientists.

Behind these stand the majority of men belonging to the medical profession. Holding, as they do, the most important and intimate relations to society, it is manifestly desirable that they should enjoy the best facilities for the acquirement of knowledge necessary to their art. In this, as in other professions or trades, the feeling of *esprit de corps* is exceedingly strong; and no class of men likes interference on the part of outsiders. To most physicians it is a matter with which the public has no concern. Society trusts its sick and dying members to the medical profession; can it not with equal confidence leave the lower animals to the same care?

The opinion of the general public is therefore, divided and confused. On the one hand, it is profoundly desirous to make systematic and needless cruelty impossible; yet, on the other, it cannot but hesitate to take any step which shall hinder medical education, impede scientific discovery, or restrict search for new methods of treating disease. What, men say, are the sufferings of an animal, however acute, compared with the gain to humanity which would result from the knowledge thereby acquired of a single curative agent? Public opinion hesitates. And yet, either by action or inaction the State must finally decide whether vivisection shall be wholly abolished, as desired by some; whether it shall be restricted by law within certain limits and for certain definite objects, as in Great Britain; or

whether we are to continue in this country to follow the example of France and Germany, in permitting the practice of physiological experimentation to any extent devised or desired by the experimentalist himself. Any information tending to indicate which of these courses is best cannot be inopportune. Having witnessed experiments by some of the most distinguished European physiologists, such as Claude Bernard (the successor of Magendie), Milne-Edwards and Brown-Sequard; and, still better (or worse, as the reader may think), having performed some experiments in this direction for purposes of investigation and for the instruction of others, the present writer believes himself justified in holding a pronounced opinion on this subject, even if it be to some extent opposed to the one prevailing in the profession. Suppose, therefore, we review briefly the arguments to be adduced both in favor of the practice and against it.

Two principal arguments may be advanced in its favor:

I. It is undeniable that to the practice of vivisection we are indebted for very much of our present knowledge of physiology. This is the fortress of the advocates of vivisection, and a certain refuge when other arguments are of no avail.

II. As a means of teaching physiological facts, vivisection is unsurpassed. No teacher of science needs to be told the vast superiority of demonstration over affirmation. Take for instance, the circulation of the blood. The student who displays but a languid interest in statements of fact, or even in the best delineations and charts obtainable, will be thoroughly aroused by seeing the process actually before his eyes. A week's study upon the book will less certainly be retained in his memory than a single view of the opened thorax of a frog or dog. There before him is the throbbing heart; he sees its relations to adjoining structures, and marks, with a wonder he never before

knew, that mystery of life by which the heart, even though excised from the body, does not cease for a time its rhythmic beat. To imagine, then, that teachers of physiology find mere amusement in these operations is the greatest of ignorant mistakes. They deem it desirable that certain facts be accurately fixed in memory, and they know that no system of mnemonics equals for such purpose the demonstration of the function itself.

Just here, however, arises a very important question. Admitting the benefit of the demonstration of scientific facts, *how far may one justifiably subject an animal to pain for the purpose of illustrating a point already known?* It is merely a question of cost. For instance, it is an undisputed statement in physical science that the diamond is nothing more than a form of crystallized carbon, and, like other forms of carbon, under certain conditions, may be made to burn. Now most of us are entirely willing to accept this, as we do the majority of truths, upon the testimony of scientific men, without making demonstration a requisite of assent. In a certain private school, however, it has long been the custom once a year, to burn in oxygen a small diamond, worth perhaps thirty dollars, so as to prove to the pupils the assertion of their text-books. The experiment is a brilliant one; no one can doubt its entire success. Nevertheless, we do not furnish diamonds to our public schools for this purpose. Exactly similar to this is one aspect of vivisection—it is a question of cost. Granting all the advantages which follow demonstration of certain physiological facts, the cost is pain—pain sometimes amounting to prolonged and excruciating torture. Is the gain worth this?

Let me mention an instance. Not long ago, in a certain medical college in the State of New York, I saw what Doctor Sharpey, for thirty years the professor of physiology in the University Medical College, London, once

characterized by antithesis as "Magendie's *infamous* experiment," it having been first performed by that eminent physiologist. It was designed to prove that the stomach, although supplied with muscular coats, is during the act of vomiting for the most part passive; and that expulsion of its contents is due to the action of the diaphragm and the larger abdominal muscles. The professor to whom I refer did not propose to have even Magendie's word accepted as an authority on the subject: the fact should be demonstrated again. So an incision in the abdomen of a dog was made; its stomach was cut out; a pig's bladder containing colored water was inserted in its place, an emetic was injected into the veins,—and vomiting ensued. Long before the conclusion of the experiment the animal became conscious, and its cries of suffering were exceedingly painful to hear. Now, granting that this experiment impressed an abstract scientific fact upon the memories of all who saw it, nevertheless it remains significantly true that the fact thus demonstrated had no conceivable relation to the treatment of disease. It is not to-day regarded as conclusive of the theory which, after nearly two hundred repetitions of his experiment, was doubtless considered by Magendie as established beyond question. Doctor Sharpey, a strong advocate of vivisection, by the way, condemned it as a perfectly unjustifiable experiment, since "besides its atrocity, it was really purposeless." Was this American repetition of Magendie's experiment worth its cost? Was the gain worth the pain?

Let me instance another and more recent case. Being in Paris a year ago, I went one morning to the *College de France,* to hear Brown-Sequard, the most eminent experimenter in vivisection now living—one who, Doctor Carpenter tells us, has probably inflicted more animal suffering than any other man in his time. The lecturer stated that injury to certain nervous centers near the base of the

brain would produce peculiar and curious phenomena in the animal operated upon, causing it, for example, to keep turning to one side in a circular manner, instead of walking in a straightforward direction. A Guinea-pig was produced—a little creature, about the size of a half-grown kitten—and the operation was effected, accompanied by a series of piercing little squeaks. As foretold, the creature thus injured did immediately perform a "circular" movement. A rabbit was then operated upon with similar results. Lastly, an unfortunate poodle was introduced, its muzzle tied with stout whip-cord, wound round and round so tightly that necessarily it must have caused severe pain. It was forced to walk back and forth on the long table, during which it cast looks on every side, as though seeking a possible avenue of escape. Being fastened in the operating trough, an incision was made to the bone, flaps turned back, an opening made in the skull, and enlarged by breaking away some portions with forceps. During these various processes no attempt whatever was made to cause unconsciousness by means of anæsthetics, and the half-articulate, half-smothered cries of the creature in its agony were terrible to hear, even to one not unaccustomed to vivisections. The experiment was a "success"; the animal after its mutilation did describe certain circular movements. But I cannot help questioning in regard to these demonstrations, *did they pay?* This experiment had not the slightest relation whatever to the cure of disease. More than this: it teaches us little or nothing in physiology. The most eminent physiologist in this country, Doctor Austin Flint, Jr., admits that experiments of this kind "do not seem to have advanced our positive knowledge of the functions of the nerve centers," and that similar experiments "have been very indefinite in their results." On this occasion, therefore, three animals were subjected to torture to demonstrate an abstract fact of

absolutely no use to medical science; a fact, too, which probably not a single one of the two dozen spectators would have hesitated to take for granted on the word of the experimenter, Brown-Sequard. Was the gain worth the cost?

This, then, is the great question that must eventually be decided by the public. Do humanity and science here indicate diverging roads? On the contrary, *the highest scientific and medical opinion of England has pronounced against the repetition of painful experiments for teaching purposes.* In 1875, a Royal Commission was appointed in Great Britain to investigate the subject of vivisection, with a view to subsequent legislation. The interests of science were represented by the appointment of Professor Huxley as a member of this commission. Its meetings continued over several months, and the report constitutes a large volume of valuable testimony. The opinions of many of these witnesses are worthy of special attention, from the eminent position of the men who hold them. The physician to the Queen, Sir Thomas Watson, with whose "Lectures on Physics" every medical practitioner in this country is familiar, says: "I hold that no teacher or man of science who by his own previous experiments, . . . has thoroughly satisfied himself of the solution of any physiological problem, is justified in repeating the experiments, however mercifully, to appease the natural curiosity of a class of students or of scientific friends." Sir George Burroughs, President of the Royal College of Physicians, says: "I do not think that an experiment should be repeated over and over again in our medical schools to illustrate what is already established."* Sir James Paget, Surgeon Extraordinary to the Queen, said

*"Report of the Royal Commission on the Practice of Subjecting Live Animals to Experiments for Scientific Purposes." Question No. 175. Reference to this volume will hereafter be made in this article by inserting in brackets, immediately after the authority quoted, the number of the question in this report from which the extract is made.

before the commission that "experiments for the purpose of repeating anything already ascertained ought never to be shown to classes." [363.] Sir William Fergusson, F.R.S., also Surgeon to her Majesty, asserted that "sufferings incidental to such operations are protracted in a very shocking manner"; that of such experiments there is "useless repetition," and that "when once a fact which involves cruelty to animals has been fairly recognized and accepted, there is no necessity for a continued repetition." [1019.] Even physiologists—some of them practical experimenters in vivisection—join in condemning these class demonstrations. Dr. William Sharpey, before referred to as a teacher of physiology for over thirty years in University College, says: "Once such facts fully established, I do not think it justifiable to repeat experiments causing pain to animals." [405.] Dr. Rolleston, Professor of Physiology at Oxford, said that "for class demonstrations, limitations should undoubtedly be imposed, and *those limitations should render illegal painful experiments before classes.*" [1291.] Charles Darwin, the greatest of living naturalists, stated that he had never either directly or indirectly experimented on animals, and that he regarded a painful experiment without anæsthetics which might be made with anæsthetics as deserving "detestation and abhorrence." [4672.] And finally the report of this commission, to which is attached the name of Professor Huxley, says: "With respect to medical schools, we accept the resolution of the British Association in 1871, that experimentation without the use of anæsthetics is not a fitting exhibition for teaching purposes."

It must be noted that hardly any of these opinions touch the question of vivisection so far as it is done without the infliction of pain, nor object to it as a method of original research; they relate simply to the practice of repeating painful experiments for purposes of physiological teaching.

We cannot dismiss them as "sentimental" or unimportant. If painful experiments are necessary for the education of the young physician, how happens it that Watson and Burroughs are ignorant of the fact? If indispensable to the proper training of the surgeon, why are they condemned by Fergusson and Paget? If requisite even to physiology, why denounced by the physiologists of Oxford and London, and viewed "with abhorrence" by the greatest of modern scientists?

Another objection to vivisection, when practiced as at present without supervision or control, is the undeniable fact that habitual familiarity with the infliction of pain upon animals has a decided tendency to engender a sort of careless indifference regarding suffering. "Vivisection," says Professor Rolleston of Oxford, "is very liable to abuse. . . It is specially liable to tempt a man into certain carelessness; the passive impressions produced by the sight of suffering growing weaker, while the habit and pleasure of experimenting grows stronger by repetition." [1287.] Says Doctor Elliotson: "I cannot refrain from expressing my horror at the amount of torture which Doctor Brachet inflicted. I hardly think knowledge is worth having at such a purchase."* A very striking example of this tendency was brought out in the testimony of a witness before the Royal Commission,—Doctor Klein, a practical physiologist. He admitted frankly that as an investigator he held as entirely indifferent the sufferings of animals subjected to his experiments, and that, except for teaching purposes, he never used anæsthetics unless necessary for his own convenience. Some members of the Commission could hardly realize the possibility of such a confession.

"Do you mean you have no regard at all to the sufferings of the lower animals?"

* "Human Physiology," by John Elliotson, M.D., F.R.S. (p. 448).

"*No regard at all,*" was the strange reply; and, after a little further questioning, the witness explained:

"I think that, with regard to an experimenter—a man who conducts special research and performs an experiment—he has *no time, so to speak, for thinking what the animal will feel or suffer!*" "You are prepared to acknowledge that you hold as entirely indifferent the sufferings of the animal which is subjected to your investigation?"—"*Yes.*" [3539-3544.]

Of Magendie's cruel disposition there seems only too abundant evidence. Says Doctor Elliotson: "Dr. Magendie, in one of his barbarous experiments, which I am ashamed to say I witnessed, began by coolly cutting out a large round piece from the back of a beautiful little puppy, as he would from an apple dumpling!" "It is not to be doubted that inhumanity may be found in persons of very high position as physiologists. *We have seen that it was so in Magendie.*" This is the language of the report on vivisection, to which is attached the name of Professor Huxley.

But the fact which, in my own mind, constitutes by far the strongest objection to unrestrained experiments in pain, is their questionable utility as regards therapeutics. Probably most readers are aware that physiology is that science which treats of the various functions of life, such as digestion, respiration and the circulation of the blood, while therapeutics is that department of medicine which relates to the discovery and application of remedies for disease. Now I venture to assert that, during the last quarter of a century, infliction of intense torture upon unknown myriads of sentient, living creatures, has not resulted in the discovery of a single remedy of acknowledged and generally accepted value in the cure of disease. It is by no means intended to deny the value to therapeutics of well-known physiological facts acquired thus in the past—such, for instance, as the more complete knowledge we

possess regarding the circulation of the blood, or the distinction between motor and sensory nerves, nor can original investigation be pronounced valueless as respects remote possibility of future gain. What the public has a right to ask of those who would indefinitely prolong these experiments without State supervision or control, is, "What good have your painful experiments accomplished during the past thirty years—not in ascertaining the causes of incurable complaints, but in the discovery of improved methods for ameliorating human suffering, and for the cure of disease?" If pain could be estimated in money, no corporation ever existed which would be satisfied with such waste of capital in experiments so futile; no mining company would permit a quarter-century of "prospecting" in such barren regions. The usual answer to this inquiry is to bring forward facts in physiology thus acquired in the past, in place of facts in therapeutics. But, in urging the utility of a practice so fraught with danger, the utmost precaution against the slightest error of over-statement becomes an imperative duty. Even so distinguished a scientist as Sir John Lubbock once rashly asserted in Parliament that, "without experiments on living animals, we should never have had the use of ether"! Nearly every American schoolboy knows that the contrary is true, that the use of ether as an anæsthetic—the most valuable discovery of modern times—had no origin in the torture of animals.

A vague impression regarding the utility of vivisection in therapeutics is still widely prevalent in the medical profession. Nevertheless, is it not a mistake? The therapeutical results of nearly half a century of painful experiments—we seek them in vain. Do we ask surgery? Sir William Fergusson, Surgeon to the Queen, tells us: "In surgery I am not aware of any of these experiments on the lower animals having led to the mitigation of pain or to improvement as regards surgical details." [1049.] Have

antidotes to poisons been discovered thereby? Says Doctor Taylor, lecturer on Toxicology for nearly half a century in the chief London Medical School (a writer whose work on Poisons is a recognized authority): "I do not know that we have as yet learned anything, so far as treatment is concerned, from our experiments with them (*i. e.* poisons) on animals." [1204.] Doctor Anthony, speak- of Magendie's experiments, says: "I never gained one single fact by seeing these cruel experiments in Paris. *I know nothing more from them than I could have read.*" [2450.] Even physiologists admit the paucity of therapeutic results. Doctor Sharpey says: "I should lay less stress on the direct application of the results of vivisection to improvement in the art of healing, than upon the value of these experiments in the promotion of physiology." [394.] The Oxford professor of Physiology admitted that Etiology, the science which treats of the causes of disease, had, by these experiments, been the gainer, rather than therapeutics. [1302.] "Experiments on animals," says Doctor Thorowgood, "already extensive and numerous, cannot be said to have advanced therapeutics much."* Sir William Gull, M.D., was questioned before the commission whether he could enumerate any therapeutic remedies which have been discovered by vivisection, and he replied with fervor: "The cases bristle around us everywhere!" Yet, excepting Hall's experiments on the nervous system, he could enumerate only various forms of disease, our knowledge of which is due to Harvey's discovery, two hundred and fifty years ago! The question was pushed closer, and so brought to the necessity of a definite reply, he answered: "I do not say at present our therapeutics are much, but there are lines of experiment which *seem to promise* great help in therapeutics." [5529.] The results of two centuries

* "Medical Times and Gazette," October 5, 1872.

of experiments, so far as therapeutics are concerned, reduced to a seeming promise!

On two points, then, the evidence of the highest scientific authorities in Great Britain seems conclusive—first, that experiments upon living animals conduce chiefly to the benefit of the science of physiology; and, secondly, that repetition of painful experiments for class-teaching in medical schools is wholly unjustifiable. Do these conclusions affect the practice of vivisection in this country? Is it true that experiments are habitually performed in some of our medical schools, often causing extreme pain, to illustrate well-known and accepted facts—experiments which English physiologists pronounce "infamous" and "atrocious," which English physicians and surgeons stigmatize as purposeless cruelty and unjustifiable, which even Huxley regards as unfitting for teaching purposes, and Darwin denounces as worthy of detestation and abhorrence? I confess I see no occasion for any over-delicate reticence in this matter. Science needs no secrecy either for her methods or results; her function is to reveal facts, not to hide them. The reply to these questions must be in the affirmative. In this country our physiologists are rather followers of Magendie and Bernard, after the methods in vogue at Paris and Leipsic, than men who are governed by the cautious and sensitive conservatism which generally characterizes the physiological teaching of London and Oxford. Every medical student in New York knows that experiments involving pain are repeatedly performed to illustrate teaching. It is no secret; one need not go beyond the frank admissions of our later text-books on physiology for abundant proof, not only of this, but of the extent to which experimentation is now carried in this country. "We have long been in the habit, in class demonstrations, of removing the optic lobe on one side from a pigeon," says Professor Flint, of Bellevue Hospital Medical College, in his excellent work

on Physiology.* "The experiment of dividing the sympathetic in the neck, especially in rabbits, is so easily performed that the phenomena observed by Bernard and Brown-Sequard have been repeatedly verified. *We have often done this in class demonstrations.*"† "The cerebral lobes were removed from a young pigeon in the usual way, an operation . . . which we practice yearly as a class demonstration."‡ Referring to the removal of the cerebellum, the same authority states: "Our own experiments, which have been very numerous during the last fifteen years, are *simply repetitions of those of Flourens, and the results have been the same without exception.*"§ "We have frequently removed both kidneys from dogs, and when the operation is carefully performed the animals live for from three to five days. . . . Death always takes place with symptoms of blood poisoning."‖ In the same work we are given precise details for making a pancreatic fistula, after the method of Claude Bernard—"one we have repeatedly employed with success." "In performing the above experiment it is generally better not to employ an anæsthetic,"¶ but ether is sometimes used. In the same work is given a picture of a dog, muzzled and with a biliary fistula, as it appeared the fourteenth day after the operation, which, with details of the experiment, is quite suggestive.** Bernard was the first to succeed in following the spinal accessory nerve back to the jugular foramen, seizing it here with a strong pair of forceps and drawing it out by the roots. This experiment is practiced in our own country. "We have found this result (loss of voice) to follow in the cat after the spinal accessory nerves have been torn out by the roots," says Professor John C. Dalton, in his Treatise on

*A Text-book of Human Physiology, designed for the use of Practitioners and Students of Medicine, by Austin Flint, Jr., M.D. D. Appleton & Co. New York: 1876 (page 722).

† Page 738. ‡ Page 585. § Page 710.
‖ Page 403. ¶ Pages 269–70. ** Page 282.

Human Physiology.* "This operation is difficult," writes Professor Flint, "but we have several times performed it with entire success;" and his assistant at Bellevue Medical College has succeeded "in extirpating these nerves for class demonstrations."† In withdrawal of blood from the hepatic veins of a dog, "avoiding the administration of an anæsthetic" is one of the steps recommended.‡ The curious experiment of Bernard, in which artificial diabetes is produced by irritating the floor of the fourth ventricle of the brain, is carefully described, and illustrations afforded both of the instrument and the animal undergoing the operation. The inexperienced experimenter is here taught to hold the head of the rabbit "firmly in the left hand," and to bore through its skull "by a few lateral movements of the instrument." It is not a difficult operation; it is one which the author has "often repeated." He tells us *"it is not desirable to administer an anæsthetic,"* as it would prevent success; and a little further we are told that "we should avoid the administration of anæsthetics in all accurate experiments on the glycogenic function."§ It is true the pleasing assurance is given that "this experiment is almost painless"; but on this point, could the rabbit speak during the operation, its opinion might not accord with that of the physiologist.

There is one experiment to which the severe denunciation of English scientists is especially applicable. Numerous investigators have long established the fact that the great sensory nerve of the head and face is endowed with an exquisite degree of sensibility. More than half a century ago, both Magendie and Sir Charles Bell pointed out that merely exposing and touching this fifth nerve gave signs of most acute pain. "All who have divided this root in living animals must have recognized, not only that it is sensitive, but that its sensibility is far more acute than that of any

* Page 489. † Page 629. ‡ Page 463. § Pages 470–71.

other nervous trunk in the body."* "The fifth pair," says Professor John C. Dalton, "is the most acutely sensitive nerve in the whole body. Its irritation by mechanical means *always causes intense pain, and* even though the animal be nearly unconscious from the influence of ether, any severe injury to its large root is almost invariably followed by cries."† Testimony on this point is uniform and abundant. If science speaks anywhere with assurance, it is in regard to the properties of this nerve. Yet every year the experiment is repeated before medical classes, simply to demonstrate accepted facts! "This is an operation," says Professor Flint, referring to the division of this nerve, "that we have frequently performed with success." He adds that "it is difficult from the fact that one is working in the dark, and it requires a certain amount of dexterity, *to be acquired only by practice.*" Minute directions are therefore laid down for the operative procedure, and illustrations given both of the instrument to be used, and of the head of a rabbit with the blade of the instrument in its cranial cavity.‡ Holding the head of our rabbit firmly in the left hand, we are directed to penetrate the cranium in a particular manner. "Soon the operator feels at a certain depth that the bony resistance ceases; he is then on the fifth pair, and the cries of the animal give evidence that the nerve is pressed upon." This is one of Magendie's celebrated experiments; perhaps the reader fancies that in its modern repetitions the animal suffers nothing, being rendered insensible by anæsthetics? "It is much more satisfactory to divide the nerve without etherizing the animal, as the evidence of pain is an important guide in this delicate operation." Anæsthetics, however, are sometimes used, but not so as wholly to overcome the pain.

* Flint: "Text-book on Human Physiology" (page 641).

† Dalton's "Human Physiology" (page 466).

‡ Flint (pages 639-40).

Testimony of individuals, indicating the extent to which vivisection is at present practiced in this country might be given; but it seems better to submit proof within the reach of every reader, and the accuracy of which is beyond cavil. No legal restrictions whatever exist, preventing the performance of any experiment desired. Indeed, I think it may safely be asserted that, in the city of New York, in a single medical school, more pain is inflicted upon living animals as a means of teaching well-known facts, than is permitted to be done for the same purpose in all the medical schools of Great Britain and Ireland. And *cui bono?* "I can truly say," writes a physician who had seen all these experiments during his course of study in Bellevue Hospital Medical College, "that not only have I never seen any results at all commensurate with the suffering inflicted, but I cannot recall a single experiment which, in the slightest degree, has increased my ability to relieve pain, or in any way fitted me to cope better with disease."

In respect to vivisection, therefore, evidence abounds indicating the necessity for that State supervision which obtains in Great Britain. We cannot abolish it any more than we can repress dissection; to attempt it would be equally unwise. Within certain limitations, dictated both by a regard for the interest of science and by that sympathy for everything that lives and suffers which is the highest attribute of humanity, it seems to me that the practice should be allowed. What are these restrictions?

The following conclusions are suggested as a basis for future legislation:

I. Any experiment or operation whatever upon a living animal, during which by recognized anæsthetics it is made completely insensible to pain, should be permitted.

This does not necessarily imply the taking of life. Should a surgeon, for example, desire to perform an experimental operation, and then permit the animal to recover so as to

note subsequent effects, there is no reason why the privilege should be refused. The discomfort following such an operation would be inconsiderable. This permission should not extend to experiments purely physiological and having no definite relation to surgery; nor to mutilation from which recovery is impossible, and prolonged pain certain as a sequence.

II. Any experiment performed thus, under complete anæsthesia, though involving any degree of mutilation, if concluded by the extinction of life before consciousness is regained, should also be permitted.

To object to killing animals for scientific purposes while we continue to demand their sacrifice for food, is to seek for the appetite a privilege we refuse the mind. It is equally absurd to object to vivisection because it dissects, or "cuts up." If no pain be felt, why is it worse to cut up a dog than a sheep or an ox? Such experiments as the foregoing might be permitted to any extent desired in our medical schools.

Far more difficult is the question of painful experimentation. Unfortunately, it so happens that some of the most attractive original investigations are largely upon the nervous system, involving the consciousness of pain as a requisite to success. In regard to this class of experiments, it seems to me that the following restrictions are only just.

III. In view of the great cost in suffering, as compared with the slight profit gained by the student, the repetition, for purposes of class instruction, of any experiment involving pain to a warm-blooded animal should be forbidden by law.

IV. In view of the slight gain to practical medicine resulting from innumerable past experiments of this kind, a painful experiment upon such an animal should be permitted solely for purposes of original investigation, and then only under supervision of the State. For such experi-

ments the physiologist should be required to obtain special permission from a State board, specifying on application (1) the object of the proposed investigations, (2) the nature and method of the operation, (3) the species of animal to be sacrificed, and (4) the shortest period during which pain will probably be felt. An officer of the State should be given an opportunity to be present; and a report made, both of the length of time occupied, and the knowledge, if any, gained thereby. If these restrictions are made obligatory by statute, and their violation made punishable, such experiments will be generally performed only when absolutely necessary for purposes of scientific research.

In few matters is there greater necessity for careful discrimination than in everything pertaining to this subject. The attempt has been made in this paper to indicate how far the State—leaning to mercy's side—may sanction a practice often so necessary and useful, always so dangerous in its tendencies. That is a worthy ideal of conduct which seeks

> "Never to blend our pleasure or our pride
> With sorrow of the meanest thing that feels."

Is not this a sentiment in which even science may fitly share? Are we justified in neglecting the evidence she offers, purchased in the past at such immeasurable agonies, and in demanding that year after year new victims shall be subjected to torture, only to demonstrate what none of us doubt? That is the chief question. For, if all compromise be persistently rejected by physiologists, there is danger that some day, impelled by the advancing growth of humane sentiment, society may confound in one common condemnation all experiments of this nature, and make the whole practice impossible, except in secret and as a crime.

*CERTAIN DANGERS OF VIVISECTION.**

What is the true value of vivisection? No question needs more careful consideration, and to none is it more difficult to make an unconditional reply. "When we have stated our terms and cleared our ground," said Cardinal Newman, "all argument is generally either superfluous or fruitless"; and assuredly, no little misapprehension exists in this matter from lacking agreement on the meaning of words. Does the gain of a scientific fact outweigh all regard for the method of its attainment? Then we must acknowledge that from innumerable tortures has resulted not a little gain. If, on the other hand, value includes an account of cost, what tribunal shall estimate for us the price of another's pain? The very word "vivisection" may include practices far more innocent of pain than the butchers' shambles, or, on the other hand, tortures as exquisitely acute and prolonged, as the torments of Damiens on the rack. Before looking at the question, let us glance briefly at a few points wherein, as a needful preliminary, it is necessary to state terms and to clear ground.

Vivisection, so far as it seems to us in any way liable to criticism, always means that for which Dr. Wilder of Cornell University suggests the word "*sentisection*,"—a presumably painful experiment upon a sentient animal. Demonstrations of physiological phenomena in our medical schools are frequently made upon animals in which sensation has ceased, and whose consciousness has passed into an

* Originally published in LIPPINCOTT'S MAGAZINE, for August, 1884. Revised.

oblivion from which it need never awake. That this is not the uniform practice in our country, is unfortunately capable of abundant proof. When a leading medical journal does "not hesitate to take the position that it is right for a few animals to suffer briefly once a year, in order to impress a physiological truth,"* it is time that the public should know that in this respect American schools of medicine occupy a position which not a single English physiologist ventures openly to advocate at the present time. If, as we are told by the same authority, "the pains inflicted in the laboratory are not caused needlessly or unintelligently," surely this is no more than might have been said by Cicero of the dying gladiator, by Calvin of the execution of Servetus, or by Sir Matthew Hale of a burning witch. An English bishop, speaking on the subject of vivisection, once told the House of Lords that "it was very difficult to decide what was unnecessary pain," and as an example of the perplexities which invested the question in his own mind, he instanced "the case of the wretched man who was convicted of skinning cats alive, because their skins were more valuable when taken from the live than the dead animal. The extra money," added the bishop, "*got the man a dinner!*"† We can hardly agree with the bishop's implied justification for such a practice, even though suggested by so distinguished ecclesiastical authority. Given an end, whose attainment is possible only through extreme suffering, and the question is not whether the pangs are needless, but rather whether the object to be attained makes justifiable the infliction of the pain.

And this is the point in dispute. Is it true that the gains from painful experiments are of such immeasurable utility to the science and art of medicine that we may look with-

* The "Medical Record," New York, July 31, 1880.

† Bishop of Peterborough, in House of Lords, June 20, 1876.

out concern at the widest possible extension of the practice? Are the deductions it gives science always clear, absolute and certain, or often equivocal, dubious and unconvincing? Are experimenters agreed upon the significance of observed phenomena, or do they differ on a thousand points, each appealing to his own experience in support of his own views? May we note any tendency in scientific enthusiasm to overrate excellence or to underestimate danger? In short, are the objects so grand, the costs so trivial, the dangers so petty, the gains to humanity so great, that society can continue without concern to relegate the whole matter to the zeal of the inquisitor, the enthusiasm of the vivisector? Omitting for the moment any consideration of the ethics of vivisection, let us consider some of the dangers arising from unlimited animal experimentation.

I. One peril to which scientific truth seems thereby to be exposed, is a peculiar tendency on the part of the apologist for vivisection without control, to underestimate the numberless uncertainties and contradictions created by experimentation upon living beings. Judging from the enthusiasm of its advocates, one would think that by this method of interrogating nature, all fallacies can be detected, all doubts determined. But, on the contrary, the result of experimentation, in many directions, is to plunge the observer into the abyss of uncertainty. Take, for example, one of the simplest and yet most important questions possible,—the degree of sensibility in the lower animals. Has an almost infinite number of experiments enabled physiologists to determine for us the mere question of pain? Suppose an amateur experimenter in London, desirous of performing some severe operations upon frogs, to hesitate because of the extreme painfulness of his methods, what replies would he be likely to obtain from the highest scientific authorities of England as to the sensibility of these creatures? We may fairly judge their probable answers

to such inquiries from their evidence already given before a royal commission.*

Dr. Carpenter would doubtless repeat his opinion that "frogs have extremely little perception of pain;" and in the evidence of that experienced physiologist, George Henry Lewes, he would find the cheerful assurance, "I do not believe that frogs suffer pain at all." Our friend applies, let us suppose, to Dr. Klein, of St. Bartholomew's Hospital, who despises the sentimentality which regards animal suffering as of the least consequence; and this enthusiastic vivisector informs him that, in his English experience, the experiment which caused the greatest pain without anæsthetics was the cauterization of the cornea of a frog. Somewhat confused at finding that a most painful experiment can be performed upon an animal that does not suffer, he relates this to Dr. Swaine Taylor, of Guy's Hospital, who does not think that Klein's experiment would cause severe suffering; but of another—placing a frog in cold water and raising the temperature to about 100°—"that," says Doctor Taylor, "would be a cruel experiment: I cannot see what purpose it can answer." Before leaving Guy's Hospital, our inquiring friend meets Dr. Pavy, one of the most celebrated physiologists in England, who tells him that in this experiment, stigmatized by his colleague as "cruel," the frog would in reality suffer very little; that if we ourselves were treated to a bath gradually raised from a medium temperature to the boiling point, "I think we should not feel any pain;" that were we plunged at once into boiling water, "even then," says the enthusiastic and scientific Dr. Pavy, "I do not think pain would be experienced!" Our friend goes then to Dr. Sibson, of St. Mary's Hospi-

* The contradictory opinions ascribed to most of the authorities quoted in this article are taken directly from the "Report of the Royal Commission on the Practice of Subjecting Live Animals to Experiments for Scientific Purposes,"—a Blue-Book Parliamentary Report.

tal, who as a physiologist of many years' standing, sees no objection to freezing, starving, or baking animals alive; but he declares of boiling a frog, "That is a horrible idea, and I certainly am not going to defend it." Perplexed more than ever, he goes to Dr. Lister, of King's College, and is astonished upon being told "that the mere holding of a frog in your warm hand is about as painful as any experiment probably that you would perform." Finally, one of the strongest advocates of vivisection, Dr. Anthony, pupil of Sir Charles Bell, would exclaim at the suggestion of exposing the lungs of a frog: "Fond as I am of physiology, I would not do that for the world!" What affectation is here! No physiologist of to-day hesitates to make experiments far more severe.

Now, what has our inquirer learned by his appeal to science? Has he gained any clear and absolute knowledge? Hardly two of the experimenters named agree upon one simple yet most important preliminary of research—the sensibility to pain of a single species of animals.

Let us interrogate scientific opinion a little further on this question of sensibility. Is there any difference in animals as regards susceptibility to pain? Dr. Anthony says that we may take the amount of intelligence in animals as a fair measure of their sensibility—that the pain one would suffer would be in proportion to its intelligence. Dr. Rutherford, for instance, never performs an experiment upon a cat or a spaniel if he can help it, because they are so exceedingly sensitive; and Dr. Horatio Wood, of Philadelphia, tells us that the nervous system of a cat is far more sensitive than that of the rabbit. On the other hand, Dr. Lister, of King's College, is not aware of any such difference in sensibility in animals, and Dr. Brunton, of St. Bartholomew's, finds cats such very good animals to operate with, that on one occasion he used ninety in making a single experiment.

Sir William Gull thinks "there are but few experiments performed on living creatures where sensation is not removed," yet Dr. Rutherford admits "about half" his experiments to have been made upon animals sensitive to pain. Professor Rolleston, of Oxford University, tells us "the whole question of anæsthetizing animals has an element of uncertainty"; and Professor Rutherford declares it "impossible to say" whether even artificial respiration is painful or not, "unless the animal can speak." Dr. Brunton, of St. Bartholomew's, says of that most painful experiment, poisoning by strychnine, that it cannot be efficiently shown if the animal be under chloroform. Dr. Davy, of Guy's, on the contrary, always gives chloroform, and finds it no impediment to successful demonstration. Is opium an anæsthetic? Claude Bernard declares that sensibility exists even though the animal be motionless: *"Il sent la douleur, mais il a, pour ainsi dire, perdu l'idee de la defense."** But Dr. Brunton, of St. Bartholomew's Hospital, London, has no hesitation whatever in contradicting this statement "emphatically, however high an authority it may be." Is it then true, that the absolute certainty of some of the most important deductions must remain forever hidden "unless the animal can speak"?

II. Between advocating State supervision of painful vivisection, and proposing with Mr. Bergh the total suppression of all experiments, painful or otherwise, there is manifestly a very wide distinction. Unfortunately, the suggestion of any interference whatever invariably rouses the anger of those most interested—an indignation as unreasonable, to say the least, as that of the merchant who refuses a receipt for money just paid to him, on the ground that a request for a written acknowledgment is a reflection upon his honesty. How otherwise than by State supervi-

* "He feels the pain, but has lost, so to speak, the idea of self defense." "Leçons de Physiologie opératoire," 1879, p. 115.

sion are we to reach abuses which confessedly exist? Can we trust the sensitiveness and conscience of every experimenter? True, there are men who can stand above the lowest creature with such exceeding pity, such anxiety to spare it every needless throe, that not a pang is inflicted of which they do not count the cost. Such an investigator was Sir Charles Bell, who hesitated even to corroborate one of the greatest physiological discoveries of this century, at the price of painful experiments. Writing to his brother, June 10, 1822, he says: "My discoveries have made more impression in France than here, and I have received a second message from Magendie, saying that if I would send them any short account, I should have the prize medal,—a ridiculous thing for an old fellow!" Three weeks later he writes again, under date of July 1: "I should be writing a third paper on the Nerves; but I cannot proceed without making some experiments which are so unpleasant to make that I defer them. You may think me silly, but I cannot perfectly convince myself that I am authorized in Nature or Religion to do these cruelties. . . . . And yet, what are my experiments in comparison with those which are daily done, and are done daily for nothing!"*

But sensitiveness like this finds few counterparts among the physiologists of history. Magendie, declaring of his mutilated animals, that *"it is droll* to see them skip and jump about,"† and driving from his lectures by his cruelties, a man destined to be among the first and most honored of British physiologists; Spalanzani, of whom Abernethy declared that he had "tortured and destroyed animals in vain";‡ Schiff, cutting the nerves of vocalization in his victims, that they may be prevented,—as he tells us with diabolic humor, "de se livrer à des concerts nocturnes,

* Letters of Sir Charles Bell, London, 1875, p. 275.

† "Journal de Physiologie," tom. III, p. 155.

‡ Lecture IV.

et de *discréditer ainsi les études physiologiques";** Mantegazza, of the University of Pavia, experimenting upon animals "with extreme delight" simply to note the effects of continuous torture and of extremest possible torment,†—these are not types of men society should wish to see multiplied in the medical profession. One of the leading physiologists in this country, Dr. John C. Dalton, admits "that vivisection may be, and has been, abused by reckless, unfeeling or unskillful persons;" that he himself has witnessed abroad, in a veterinary institution, operations than which "nothing could be more shocking." And yet the unspeakable atrocities at Alfort, to which, apparently, Dr. Dalton alludes, were defended upon the very ground that he and his associates occupy to-day in advocating the present methods of experimentation in laboratory and classroom; for the *Academie des Sciences* decided that there was "no occasion to take any notice of complaints; that in the future, as in the past, vivisectional experiments must be left entirely to the judgment of scientific men." The experiments that seemed "atrocious" to the more tender-hearted Anglo-Saxon were regarded as perfectly justifiable by the scientists of France.

A curious question suggests itself in connection with this point. There can be little doubt, I think, that the sentiment of compassion and of sympathy with suffering is more generally diffused among all classes of Great Britain than elsewhere in Europe; and one cannot help wondering what our place might be, were it possible to institute any reliable comparison of national humanity. Should we be found in all respects as sensitive as the English people? Would indignation and protest be as quickly and spontaneously evoked among us by a cruel act? The question may appear an ungracious one, yet it seems to me there exists some reason

* "Leçons sur le Physiologie de la Digestion," tom. I, p. 291.

† "The Lancet." London. No. 2482, p. 415.

why it should be plainly asked. There is a certain experiment—one of the most excruciating that can be performed—which consists in exposing the spinal cord of the dog for the purpose of demonstrating the functions of the spinal nerves. It is one, by the way, which Dr. Wilder forgot to enumerate in his summary of the "four kinds of experiments," since it is not the "cutting operation" which forms its chief peculiarity or to which special objection would be made. At present all this preliminary process is generally performed under anæsthetics: it is an hour or two later, when the animal has partly recovered from the severe shock of the operation, that the wound is reopened and the experiment begins. It was during a class demonstration of this kind by Magendie, before the introduction of ether, that the circumstance occurred which one hesitates to think possible in a person retaining a single spark of humanity or pity. "I recall to mind," says Dr. Latour, who was present at the time, "a poor dog, the roots of whose vertebral nerves Magendie desired to lay bare to demonstrate Bell's theory, which he claimed as his own. The dog, mutilated and bleeding, twice escaped from under the implacable knife, and threw its front paws around Magendie's neck, licking, as if to soften his murderer and ask for mercy! I confess I was unable to endure that heartrending spectacle." Now, what do English physiologists and vivisectors of the present day think of the repetition of this experiment solely as a class demonstration?

They have candidly expressed their opinions before a royal commission. Dr. David Ferrier, of King's College, noted for his experiments upon the brains of monkeys, affirms his belief that "students would rebel" at the sight of a painful experiment. Dr. Rutherford, who certainly dared do all that may become a physiologist, confesses: "*I dare not* show an experiment upon a dog or rabbit before students, when the animal is not anæsthetized." Dr. Pavy,

of Guy's Hospital, asserts that a painful experiment introduced before a class "would not be tolerated for a moment." Sir William Gull, M.D., believes that the repetition of an operation like this upon the spinal nerves would excite the reprobation alike of teacher, pupils, and the public at large. Michael Foster, of Cambridge University, who minutely describes all the details of the experiment on recurrent sensibility in the "Handbook for the Physiological Laboratory," nevertheless tells us, "I have not performed it, and have never seen it done," partly, as he confesses, "from horror at the pain." And finally Dr. Burdon-Sanderson, physiologist at University College, London, states with the utmost emphasis, in regard to the performance of this demonstration on the spinal cord, "I am perfectly certain that no physiologist—none of the leading men in Germany, for example—would exhibit an experiment of that kind."*

Now mark the contrast. This experiment—which we are told passes even the callousness of Germany to repeat; which every leading champion of vivisection in Great Britain reprobates for medical teaching; which some of them shrink even from seeing, themselves, from horror at the tortures necessarily inflicted; which the most ruthless among them dare not exhibit to the young men of England,—this experiment has been performed publicly again and again in American medical colleges, without exciting even a whisper of protest or the faintest murmur of remonstrance! The proof is to be found in the published statements of the experimenter himself. In his "Text-Book of Physiology," Professor Flint says, "Magendie showed very satisfactorily that the posterior roots (of the spinal cord) were exclusively sensory, and this fact has been confirmed by more recent observations upon the higher classes of ani-

* This of course was not only untrue, but it is difficult to imagine that its untruth was unknown to the speaker. "The leading men of Germany" do not hesitate at vivisection far worse than this.

mals. We have ourselves frequently exposed and irritated the roots of the nerves in dogs, in public demonstrations in experiments on the recurrent sensibility, . . . and in another series of observations."*

This is the experience of a single professional teacher; but it is improbable that this experiment has been shown only to the students of a single medical college in the United States; it has undoubtedly been repeated again and again in different colleges throughout the country. If Englishmen are, then, so extremely sensitive as Ferrier, Gull, and Burdon-Sanderson would have us believe, we must necessarily conclude that the sentiment of humaneness is far stronger in Britain than in America. Have we then drifted backward in humanity? Have American students learned to witness, without protest, tortures at the sight of which English students would rebel? We are told that there is no need of any public sensitiveness on this subject. We should trust entirely, as they do in France,—at Alfort, for example,—"to the judgment of the investigator." There must be no lifting of the veil to the outside multitude; for the priests of unpitying science there must be as absolute immunity from criticism or inquiry as was ever demanded before the shrine of Delphi or the altars of Baal. "Let them exercise their solemn office," demands Prof. Wilder, "not only unrestrained by law, but upheld by public sentiment."

For myself, I cannot believe this position is tenable. Nothing seems to me more certain than the results that must follow if popular sentiment in this country—knowing the truth,—shall sustain the public demonstration of experiments in pain, which can find no open defender among the physiologists of Great Britain. It has been my fortune to know something of the large hospitals of Europe; and I do not know one in countries where painful vivisection flour-

*"A Text-Book of Human Physiology." By Austin Flint, Jr., M.D. New York, 1876. Page 589; see also page 674.

ishes unchecked by law, wherein the poor and needy sick are treated with the sympathy, the delicacy, or even the decency, which so universally characterize the hospitals of England. When Magendie, operating for cataract, plunged his needle to the bottom of his patient's eye, that he might note upon a human being the effect produced by mechanical irritation of the retina, he demonstrated how greatly the zeal of the experimenter may impair the responsibility of the physician and the instinctive sympathy of man for suffering humanity.*

III. Another danger inherent to the practice of vivisection is the injury to Science caused by an exaggeration of its utility. For, despite much argument, the extent of this utility remains still an open question. No one is so foolish as to deny the possibility of future usefulness to any discovery whatever; but there is a distinction, very easily slurred over in the eagerness of debate, between present applicability and remotely potential service. Science never needs the tribute of inaccuracy and untruth. Every discovery in vital phenomena is a gain to physiology as a science; if this be all that we can perceive as profit, why is it needful to imagine more? Art does not defend her existence by reference to the ledger; nor Philosophy deign to count purses with Commerce. Yet there has been in medicine, or surgery, hardly any advance in modern times, but some zealot has attributed it solely to experimentation upon animals; there is not an experiment so hideous or brutal, but that some defender has arisen to excuse it, because perpetrated "in the interests of sick and suffering humanity!" Why is it that this line of argument is heard chiefly in England and America where vivisection is most severely challenged, and hardly, if at all, on the continent, where are practised, as we are told by good authority, "the more

* "An Elementary Treatise on Human Physiology." By F. Magendie. American Edition, p. 64.

brutal methods of physiological experiments?"* Dr. Herman, for instance, the great German apologist for vivisection, tells us frankly and honestly, "The advancement of our knowledge, and not practical utility to medicine, is the true and straightforward object of all vivisection. *No true investigator in his researches thinks of practical utilization.* Science can afford to despise this justification with which vivisection has been defended."† Regarding the practical utility of vivisection, surely the opinion of the leading vivisector of France for the last quarter century should be accepted as scientific authority; but Claude Bernard tells us it is hardly worth while to inquire. "A ceux qui nous demandent ce qu'a produit la médicine expérimentale, nous sommes donc fondés à repondre, *qu'elle est née à peine. . . . Sans doute nos mains sont vides anjourd'hui,* mais notre bouche peut-etre pleine de légitimes promesses pour l'avenir."‡ With hands empty, but mouths full of promises for the future, thus stands vivisection, in the mind of the most eminent physiologist of the nineteenth century!

Was Claude Bernard in any way right as to the "empty hands"? Has vivisection within the last quarter century, produced a single remedy, the value of which is beyond question? I doubt it; remedies there are, but they are still in the experimental stage. On the other hand, scientific evidence points to the appalling conclusion, that during the last thirty years, some of the chief forms of incurable disease have steadily increased in fatality, notwithstanding the vast increase of the practice of vivisection. There is no doubt of this fact; the authority for the statement is

* "The Medical Record." New York. July 10, 1880.

† "Die Vivisectionsfrage. Für das grössere Publicum beleuchtet." By Dr. L. Herman, Professor of Physiology, Zurich. London Translation, page 16.

‡ "Leçons sur Le Diabète." Paris, 1877. p. 43.

one upon which reliance may be placed,—the statistics of a nation's mortality, presented to the British Parliament. To every million inhabitants of England and Wales, how many deaths were annually due to the causes here named, during the five-year periods into which, for purposes of comparison, the quarter century is divided?*

ENGLAND AND WALES. DEATHS, ANNUALLY, TO EACH MILLION OF POPULATION.

Causes of Deaths.	'71–'75	'76–'80	'81–'85	'86–'90	'91–'95	1896
Diphtheria	121	122	156	169	253	292
Cancer	446	494	548	632	712	764
Diabetes	36	40	51	62	69	74
Other Constitutional Diseases	60	87	108	131	156	—
Heart and Circulation	1257	1415	1467	1685	1677	—
Kidneys, etc.	326	375	422	447	453	—
Digestive System	558	572	569	616	707	—
Intemperance†	38	42	48	56	68	71
Suicide	66	74	75	79	87	86

These are startling facts; yet they are not the only instances wherein the fatality of disease outstrips the

* In 1881 it was decided by the Registrar-General to change somewhat the classification of some of the causes of death in use up to that time. One result of this change has been to render it impossible to compare the statistics of certain causes of mortality during the years preceding 1881 with later periods. As it is desired to present statistics coming down to the present time, the tabulated statements which follow vary from those presented in the original essay.

† The steadily increasing rate of mortality due to chronic alcoholism and suicide is so significant of tendency that it is here included with other causes of death. Of course any deductions to be drawn from other causes of death have no relation to these; they are here given simply as facts of interest. It may be questioned, however, whether the Medical Profession ought not to speak with greater emphasis than has characterized its past utterances, regarding the influence of intemperance upon incurable diseases and premature death.

progress of medical art.* Although the death-rate of England has very sensibly diminished during the past half century, the decrease has chiefly been due to the lessened mortality of childhood and to the vast influence of Public Hygiene in the prevention of disease. "It is a fact," said the Registrar-General in his report of 1881, "that while mortality in early life has been very notably diminished, the mortality of persons in middle or advanced life has been steadily rising for a long period of years." Probably the same story would be told by the records of other nations; it is quite useless to refer to the United States, since in regard to statistical information of this kind, we still lag behind every civilized country in the world.† And whatever may be the cause of this increasing fatality, it is evident that vivisection has opened no door through which those subject to the stress and strain of life may escape from the penalties imposed by nature upon those who either ignorantly or recklessly break her laws.

What then is the substance of the whole matter? It seems to me the following conclusions are justified by the facts presented.

I. Experiments upon living animals may be divided into two general classes; first, those which produce pain,—

* The annual death-rate of diphtheria, which for ten years (1871–1880) was less than 122, rose to 292 in the year 1896,—the highest rate of mortality in thirty-three years—notwithstanding the use of antitoxin; insanity,—including general paresis,—cost the nation 90 lives per million in 1882, and 119 in 1897. During the same period, disease of the spinal cord increased its rate of mortality from 59 to 71; Bright's disease rose from 208 to 265; apoplexy from 512 to 574; valvular disease of the heart from 209 to 343, and diseases of the stomach from 97 to 162.

† Even Japan, not yet a Christian nation, has far better statistical information at hand every year regarding her people than can be had regarding the population of the United States. To Europe it must seem inexplicable that our Government cannot even tell the number of murders or lynchings that annually occur within our borders.

slight, brief, severe or acute and prolonged; and second, those experiments which are performed under anæsthesia, from which may follow either death during unconsciousness, or entire recovery.

II. A large number of the vivisections requisite for purposes of teaching physiological facts may be so carried on as to take life with less pain or inconvenience to the animal than is absolutely necessary in order to furnish meat for our tables. Those who would make it a penal offense to submit to a class of college students the unconscious and painless demonstration of functional activity of the heart, for example, and yet demand for the gratification of appetite the daily slaughter of oxen and sheep without anæsthetics, and without any attempt to minimize the agony of terror, fear and pain attendant upon butchery, hold opinions which the writer cannot share.

III. Prohibition of all experiments may be fairly demanded by those who believe that the enthusiastic ardor of the scientific experimenter will outweigh all considerations of good faith, provided the success of his experiment depend on the consciousness of pain; in other words, that the experimenter himself, as a rule, cannot be trusted to obey the law, should the law restrict.

IV. Absolute liberty in the matter of painful experiments has produced admitted abuses by physiologists of Germany, France and Italy, and in America it has led to the repetition before classes of students of Magendie's extreme cruelties,—demonstrations which have been condemned by every leading English physiologist.

V. In view of the dangerous impulses not unfrequently awakened by the sight of bloodshed, or pain intentionally inflicted, experiments of this kind should by legal enactment be entirely forbidden before classes of students in our schools.

VI. It is not in accord with scientific accuracy to contend for unlimited freedom of painful experimentation, on the ground of its vast utility to humanity in the discovery of new methods for the cure of disease.

VII. Vivisection, involving the infliction of pain, is, in its best possible aspect, a practice so linked to danger, that it should be placed under the control and supervision of the State.

CONCERNING A PRIZE ESSAY.

A short time since, while calling at the office of the American Humane Education Society in Boston, there was put into my hands, with other documents, a copy of the "Five Hundred Dollar Prize Essays" for and against the practice of vivisection. For some reason, perhaps because of prolonged absence abroad, this pamphlet, which has been so widely circulated, never before came to my notice. Glancing it over, I was rather startled to see that both essayists had quoted from what I had written on the same subject, to support their widely variant views; but, when at more leisure I came to study carefully the argument of Dr. Macphail in defence of vivisection, surprise gave way to indignation. To what extent it was justifiable, the reader shall judge.

From nineteen essays in favor of vivisection, a committee from Harvard University Medical School selected that of Dr. Macphail, as the best. Apparently the committee made no attempt to test the accuracy of his quotations, assuming, perhaps, that an advocate of scientific research would of course be scientifically exact in statements of arguments or relation of facts. That this faith was not justified is abundantly evident. Let me quote one paragraph of this essay in regard to which I can speak with especial emphasis:

"Dr. Leffingwell, by quotations from the physiological treatises of Professors Dalton and Flint, shows that there are only seven cases in which anæsthetics are not always employed; and in them there is reason to believe the pain is either brief or not very severe, and that there is also reason for belief that there is an annual decrease in the number of such demonstrations. The charge of Ray Lankester is thus disproved, that the number of experiments must increase in geometric ratio as physiology advances."

What does Dr. Macphail mean by this paragraph? Here are four distinct statements, and every one of them is untrue. I challenge Dr. Macphail to produce the evidence upon which he has declared that I have shown "there are only seven cases in which anæsthetics are not always employed, and in them there is reason for belief the pain is brief, or not very severe," etc. Nothing of the kind was ever even attempted to be shown by anything I ever wrote. In the two essays which I contributed to *Scribner's Monthly* and *Lippincott's Magazine,* perhaps a dozen instances of vivisection experiments were mentioned. Not a word, not a single word of either article, can by any manner of interpretation be distorted into a statement that these were the "only seven cases in which anæsthetics are not always used," or "that there is reason for belief that there is an annual decrease in the number of these demonstrations." Why, Dr. Macphail must know that, if any one should say there were "only seven" painful experiments, it would be a falsehood. He is not ignorant of the range of physiological investigation.

Dr. Macphail has been awarded $250 for his essay. It is too late to protest against it; but, if he can quote from any of my writings in proof that I have shown or attempted to show the annual decrease in experimentation, its comparative painlessness, and that there are only seven cases in which anæsthetics are not always used, I shall be pleased to tax myself another $250 for the benefit of his purse. If, on the contrary, he can produce no such evidence, then it seems to me that some portion of the prize awarded him might be returned to the American Humane Education Society,—a self-imposed tax for careless and inaccurate quotation.

Dr. Macphail seems to have a fine contempt for foot-notes and references. It is somewhat difficult therefore to decide the value of other statements of his essay. Some of them

I should assuredly question; for their support, evidence must be adduced infinitely superior to anything he has given. Take, for instance, that remarkable narrative of a missionary in India who "by vivisection obtained an antidote successful in sixty cases out of one hundred of bite by the brown viper, and with it saved the life of a fellow-worker, who was afterwards instrumental in inducing two thousand natives to embrace Christianity." To any one who has never lived in India, there seems nothing especially improbable in the story. It looks plausible at first sight, but the omissions are suspicious. In what part of India did that missionary live? What is the nature of his "antidote?" Is the bite of a viper always otherwise fatal? What proof exists that the cures were exactly sixty per cent.? What is the name and address of that "fellow-worker" whose life was saved by the newly-discovered antidote? Upon what evidence rests the claim that, subsequent to his rescue from death, he was instrumental in the conversion of heathen to Christianity? Any one acquainted with the stubborn adhesion of the Hindu and Mahomedan peasantry of India to their own faith must acknowledge that labors so efficient ought not to have been hidden under an anonymous story. Yet the entire narrative is given without a word of proof by an advocate of "scientific research!"

Other assertions of the prize essayist are equally untrustworthy, but it is difficult to explain their untrustworthiness outside the medical profession, or to casual readers. "In one year Dr. Echeverria collected 165 cases of epilepsy, of which 75 were cured by following the principles of localization laid down by Ferrier." The unprofessional reader would fancy this meant that nearly half the cases of epilepsy were now curable by some new method of treatment. On the contrary, I venture the assertion that Dr. Macphail never cured a single case of epilepsy by following the principles of localization laid down by Ferrier. "Glanders," he

asserts, "can only be diagnosed by the method of inoculating animals" (p. 35). Nonsense. If Dr. Macphail's hostler should ever contract this disease, I have full faith in the ability of his employer to detect it without resort to vivisection. "Hydrophobia is now robbed of its terrors" (p. 35). Then it is no longer fatal? The reports of the registrar-general of England tell a different story, and the reports of the Pasteur Institute confirm it. By vivisection, "Martin of Berlin proved the possibility of ovariotomy" (p. 33). Why, the operation of ovariotomy was performed by the American physician, Dr. McDowel, before Martin of Berlin was born. "In the American Civil War, out of 3,717 cases of wounded intestines, 3,273 cases ended fatally." Now, Dr. Macphail says, if certain vivisectional experiments had been performed before the Civil War, 3,263 soldiers, instead of 446, would now be living; "and their injuries would not even be considered grave enough to entitle them to a pension!" (p. 32.) Was ever a more stupid deduction reached by a scientific writer? What earthly reason has Dr. Macphail for assuming that a certain surgical operation, if it could have been performed on soldiers during our struggle of a third of a century ago, would have insured the lives of all who submitted to it *up to the present day?* For that is what he says. No allowance is made for the death of these veterans from disease or accident; "they would now be living," thirty years after the war! It may be admitted that abdominal surgery has been greatly advanced by certain experimental studies; but why claim more? One may grant much to modern surgery without admitting its potency to secure an immunity like this,—something, indeed, never imagined by any one but the prize essayist.

The poison of venomous serpents, he says, has been isolated,—a step necessary before "discovering an antidote to a poison which annually carries off twenty thousand victims."

Evidently Dr. Macphail is referring to the mortality from snake bites in the only country where such mortality exists of which any statistical record is made, the average annual deaths in British India from bite of serpents during five years (1883-87) being 20,342. Now, I deny that the poison of serpents has been isolated. A writer on the subject in the last number of the English "Quarterly Review" says plainly that, "as to the venom of serpents, no distinct chemical principle has as yet been detected in it. . . . No effectual antidote has been discovered." It is over twenty years since Sir Joseph Fayrer began his experiments in Calcutta. They were in progress in India when I visited that country in 1882; and to-day, the best treatment there is precisely what it was in this country half a century ago, immediate cauterization or excision, and the free use of some alcoholic stimulant.

"The most brilliant vindication of vivisection is now under our eyes, the results that have attended Dr. Koch's experiments on animals, by which tuberculosis is likely to be stayed" (p. 33). This was written two years ago. To-day I hardly think even Dr. Macphail would care to bring forward as the most brilliant vindication of the practice of vivisection the generally discredited "consumption cure" of Dr. Koch. That he could make it then an argument for unlimited experimentation is significant.

In the presentation of arguments for a practice so liable to abuse, it seems to me of exceeding importance that the line of exact truth and precise statement should never be passed. What is there about vivisection that so frequently impairs scientific accuracy on the part of its advocates? This is a problem worth solution.

VIVISECTION IN AMERICA.

I. VIVISECTION IN MEDICAL SCHOOLS.

Upon no ethical question of our day is there a more striking difference of opinion than regarding the value or the righteousness of experimentation upon living animals. About this practice the atmosphere of controversy is thick with the dust of contradiction and dispute. "It is one of the foundations of medical science," asserts one authority. "The conclusions of vivisection are absolutely worthless," is the reply of one of the most eminent surgeons of our time.* "It is a mild, merciful, and, for the most part, painless interrogation of Nature, and her secrets of life," says a recent apologist and advocate of vivisection. "The experiments of certain physiologists are those of inhuman devils," says Canon Wilberforce, of England. Among contradictions like these one may well ask, where is truth to be found?

The solution of this strange divergence of opinion is not difficult; it lies simply in the absence of careful definitions of the words we use. "Vivisection" is a term which includes some kinds of operations upon living animals involving excruciating and prolonged torture; and some other operations which simply destroy life with the discomfort of induced disease; and yet other experiments which involve no pain whatever. It is a practice of almost infinite variety and complexity. To speak of it as inevitably involving the infliction of torture is to betray ignorance; to defend it on the ground that pain is never

* Mr. Lawson Tait of England.

inflicted, and that alleged abuses rarely occur, is to state what every student of physiology knows to be false.

Atrocities of vivisection are facts of history. It is well perhaps at the outset to take a glance at some of them. What has been done by men without pity, in the hope to wrest from Nature something she has hid?

The abuses of research include every form of excruciating and lingering torment that can be conceived. In the august name of Science, animals have been subjected to burning, baking, freezing; saturation with inflammable oil and then setting on fire; starvation to death; skinning alive; larding the feet with nails; crushing and tormenting in every imaginable way. Human ingenuity has taxed itself to the utmost to devise some new torture, that one may observe what curious results will ensue. For instance, Dr. Brachet, of Paris, by various torments, inspired a dog with the utmost anger, and then, "when the animal became furious whenever it saw me, I put out its eyes. I could then appear before it without the manifestation of any aversion. I spoke, and immediately its anger was renewed. I then disorganized the internal ear as much as I could, and when intense inflammation made it deaf, then I went to its side, spoke aloud, and even caressed it without its falling into a rage." Of this one man Dr. Elliotson, in his work on "Human Physiology," goes out of his way to say: "I cannot refrain from expressing my horror at the amount of torture which Dr. Brachet inflicted. I hardly think knowledge is worth having at such a purchase."*

Von Lesser, of Germany, made a long series of experiments in scalding animals to death. He "plunged a dog for thirty seconds into boiling water;" he "scalds another four times, at various intervals;" even animals which have just passed through the pangs of parturition do not escape.†

* "Elliotson's Physiology," p. 448.

† "Virchow's Archiv." vol. lxxix, pp. 248–289.

Dr. Castex, of Paris, fastens a dog to the dissecting-table and, discarding the use of anæsthetics, stands above it "with a large empty stone bottle. I strike with all my strength a dozen violent blows on the thighs. By its violent cries the animal shows that the blows are keenly felt." Of another victim: "I dislocate both the shoulders, doing it with difficulty; it appears to suffer greatly;"* and so on through the long series.

Chauveau "consecrated" more than eighty large animals, mostly horses and mules, worn out in the service of man, to almost the extremest torture possible to conceive, not, as he expressly tells us, "to solve any problem in medical theory," but simply to see what degree of pain can be inflicted through irritation of the spinal cord. Mantegazza, of Milan, devoted a year to the infliction of torment upon animals—some pregnant, some nursing their young—in a long series of experiments which had no conceivable relation to the cure of disease, and which ended in the attainment of no beneficial or even instructive results. To produce what he desired—the extremest degree of pain possible—he invented a new machine, which he calls his "tormentor," and in this fiendish device, little animals, which had been first "quilted with long thin nails," so that the slightest movement is agony, are racked with added torments; torn and twisted, crushed and lacerated, hour by hour, till crucified Nature will no longer endure, and sends death as a tardy release. Yet all these experiments, repeated day after day, were conducted, as Mantegazza himself asserts, not with pity or repugnance; of *that,* no admission is made; but "with much delight and extreme patience for the space of a year."† One stands in mute amazement at revelations like these. Dante in his "Inferno" never dreamed of torture so awful as certain refinements of tor-

* "Archives de Médecine," January 1892, pp. 9–22.

† "Fisiologia del Dolore," di Paoli Mantegazza, p. 101.

ment which Professor Mantegazza invented and executed, of which the details cannot be told.* Is there any vivisection more awful to contemplate than a man like this who has succeeded in plucking from his heart every sentiment of pity or instinct of compassion? And how barren of benefit were the results of these experiments! Out of all these multiplied torments of Richet and Mantegazza, of Chauveau and Castex, of Magendie and Brown-Séquard, science has found not one single remedy to disease, not one discovery of the slightest value to mankind!

What have the atrocities of experimentation to do with America? Much, every way. There is hardly an apologist for unlimited vivisection in America who will not admit that such cruelties are to be deplored, and that scientific curiosity has driven these men into unpardonable excess. But how did it happen? Were they by nature more brutal than other men? Probably not. On one point the teaching of History is uniform. Wherever is conferred power without responsibility, there will follow—there must inevitably follow—license and abuse. It is the relation of cause and effect. Perhaps we execrate unduly the heartlessness of a Nero or a Robespierre, a Magendie or a Mantegazza. They were but the natural product of the time which made them monsters of cruelty, by the gift of absolute power.

But are such glaring abuses possible in America? Why not? The realm of pain has here no boundaries which investigation is required to observe. In no American State or Commonwealth is there any law, any statute of any kind whatever, which would prevent these same experiments from being repeated here as often as desired. Now, is it probable that in a country like ours, with a population drawn from every foreign source, experimental research, thus unrestrained, remains free from the excesses which have stained it everywhere else—in Italy, in Germany, in

* "Fisiologia del Dolore," pp. 102–3.

France? The absence of clear, definite, and reasonable limitations beyond which vivisection becomes cruelty, and should not go—is of itself an invitation to abuse. Such restrictions elsewhere have been successfully initiated. In England, Scotland, and Ireland—countries whose medical skill is quite equal to our own—a painful experiment for the illustration of facts already known has been prohibited for over fifteen years. The law there has placed a limit; and the law is obeyed. It has not remedied every evil, but at any rate it has prevented to a large extent that "abuse of vivisection by reckless, unfeeling, and unskilful persons," which the American physiologist, Dalton, admitted and deplored.

Not merely the absence of legal limitations, but the absence of all supervision, is another invitation to excess. Up to fifteen or twenty years ago, when agitation against cruelty had just begun, it was the custom not only to show results of experiments but to perform even the most excruciating operations on living animals before a class-room of students, as aids to memory. There was no special secrecy about them; anyone able to find his way to the lecture-room could observe everything. If there were indefensible cruelties, they were at any rate as unconcealed and as openly done as in Paris to-day. Now, all this is changed. Experimentation has vastly increased; but it exists largely in comparative secrecy, behind locked doors, guarded by sentinels. To the largest physiological laboratory of New York City, even the President of the Society for the Prevention of Cruelty to Animals cannot gain admittance during hours for "work." Against reasonable privacy of this kind no criticism can be justly urged. An anatomical dissecting-room, for instance, ought not to be open to every passer-by. But if bodies for dissection were, to-day, as frequently the result of mysterious murder or violated graves as in the time of Burke and Hare, and yet all

entrance to the dissecting-room, all inspection or oversight, were absolutely refused, we may be sure that an alarmed and indignant public sentiment would demand, not the publicity of dissection, but its supervision and control by the law. For the world does not like overmuch secrecy, and right doing never needs it. We are touched with a feeling of horror, to-day, not so much by the long procession in the Auto-da-fé as by remembrance of all the awful mystery which preceded it; the dim-lighted underground dungeons; the application of the "question" at midnight; the groans for mercy which met no response; the shrieks of agony which only the stone walls echoed. The Bastile rises without protest; but in course of centuries it becomes an interrogation-point which Paris cannot answer; then comes a 14th of July, and it is swept from the face of the earth. Even Science needs that Pity should stand by her side. True, from the standpoint of anti-vivisection, inspection is not demanded; it means, one says, "compromise and acknowledgment." But it means more than this; it means accurate knowledge of all the facts; the dispersion of error; illumination, enlightenment, certitude. "Misjudgment of vivisection exists," one says. Well, how is it to be dispelled by all this concealment and secrecy?* No real impediment to any experimentation that is not abuse, can result from bringing laboratories and all their work under the inspection of qualified representatives of the Societies for protection of animals and the prevention of cruelty.

* "This brings me to what I can but conceive as a grave and profound mistake on the part of the experimentalists,—their secrecy. . . . Every laboratory should publish an annual statement setting forth plainly the number and kind of experiments, the objects aimed at, and most definitely—the methods of conducting them."

—From *Address of Dr. George M. Gould (now Editor of the Phil. Med. Journal) before Academy of Medicine, 1896.*

Upon the excesses into which a perverted zeal or cruel indifference has led experimenters in America, it is hardly necessary to dwell. Proofs are abundant enough; one needs only to study certain American text-books of physiology, where the various experiments performed, "for teaching purposes," every year, are frankly related. Once we admit the right to torture a living creature simply as an aid to memory, and where shall we put bounds to the cruelty one may inflict? Is it an abuse of experimental science to cut out the stomach from a living dog—the "infamous experiment of Magendie," as Dr. Sharpey calls it? I have seen it done, not in Europe, but America. To cut down upon the spinal cord of a dog for the demonstration of its functions—an operation which Dr. Michael Foster, of Cambridge University, has never seen performed, from "horror of the pain?" Where is there a medical college in America in which it has never been done? Is it an abuse of vivisection to freeze rabbits to death before a class of young men and young women merely to illustrate what everyone knew in advance? It is done annually. To divide the most acutely sensitive nerve in the whole body in order to prove what nobody doubts? It is one of the "regular experiments." To mutilate a living animal so severely that left to itself, death might occur; to fasten it so that struggle is useless; to set in operation delicate machinery which shall cause it to breathe by artificial force, and so to keep it through a long night of terror and pain till "wanted" for the final sacrifice of demonstration before students on the following day? It is not of infrequent occurrence in American laboratories. "It helps memory," says one. But what gain to memory can outweigh that blunting of compassion, that deterioration of pity, which all this familiarity with torture tends to induce? "What doth it profit a man" to see it all? Let Dr. Bigelow, late Professor of Surgery at Harvard University, reply: "Watch the

students at a vivisection. It is the blood and suffering, not the science, that rivets their breathless attention. If hospital service makes young students less tender of suffering, vivisection deadens their humanity and begets indifference to it."

"But," somebody protests, "surely there should be no limitations or conditions regarding original researches?" Well, why not? Investigation in America has been absolutely unrestrained for forty years; has it accomplished anything of value? Have not even American scientists been subject to an enthusiasm that, during investigation, takes no account of the pain it inflicts? Look, for example, at that series of one hundred and forty-one experiments performed not long ago in Jersey City, opposite New York. The object of the experimenter was, as he tells us in his account of them, "to produce the greatest amount of injury" to the spinal cord and its attachments without killing the animal outright; and with this end in view a great number of dogs, with hobbled limbs, were dropped from a height of twenty-five feet, so as to effect all the severest injuries thus designed. Strange, indeed, it is to read the record of experiment after experiment, and to note that "even a few hours after they had been dropped, when the experimenter presented himself to their view, the dogs not severely injured never failed to greet their master with extravagant expressions of joy." Well, what judgment are we entitled to pass on these investigations? What valuable discovery for the benefit of suffering humanity accrued therefrom? The highest European authority upon medical questions shall tell us: "It is a record of the most wanton and stupidest cruelty we have ever seen chronicled under the guise of scientific experiments. If this were a type of experimental inquiry indulged in by the profession, public feeling would be rightly against us; for, apart from the utterly useless nature of the observations, so far

as regards human surgery, there is a callous indifference shown in the descriptions of the sufferings of the poor brutes which is positively revolting. . . Badly planned and without a chance of teaching us anything, and carried out in a wholesale cruel way, we cannot but feel ashamed of the work as undertaken by a member of our profession."*

This is the judgment of the British Medical Journal, the leading authority of Great Britain. Here we have criticism based upon knowledge of what constitutes an abuse of scientific research. It cannot be swept aside as the wailing of sentiment or the exaggeration of ignorance.

Take another instance of "original investigations." Crile, an American physiologist, has recently demonstrated to what extent experimentation may be carried on here in America, where, as he, himself, tells us, "there is no law governing vivisection." Experimenting upon 132 dogs, he subjected them to every form of conceivable injury;† cutting, tearing and burning the skin; cutting and crushing muscles; crushing the joints; puncturing the ear; crushing, tearing, cutting and burning the tongue; pouring boiling water within the abdomen; manipulating vital organs; burning and crushing the paws; tearing and crushing nerves,—together with other operations too hideous for mention. To the scientific ardor of this young man, even pregnancy of the animal suggested no reason for excluding the creature from experimentation. We are told, indeed, that sometimes curare or morphia, sometimes chloroform or ether were used; but the extent of their employment is carefully withheld; and it is a significant fact that in not a single experiment is it claimed that by the use of anæsthetics, the animal, so crushed, torn and burned, was made insensible to pain. The

*"British Medical Journal," Nov. 15, 1891.

†Experimental Research into Surgical Shock. Philadelphia.

use of it all? There was no use; the utility of the experiments was not even expected. "The present research had progressed but little, before it became apparent . . . that *a clearly satisfactory termination could not be hoped for.*"* He freely admits "the incompleteness of the research," which gave to medical science not a single new fact of any value.

What may be done in America to prevent these abuses? Denounce the entire medical profession as in a league with "inhuman devils" of cruelty? That is folly; the man who has watched at midnight with some old family physician, by the bedside of his dying wife or child, will not hear you. But what shall we aim to do for our country, and to-day? Is not reform of abuse the first practical step? The duty of the hour, it seems to me, is the excitation of interest in this subject; the acquisition of accurate knowledge about it; the encouragement of intelligent personal investigation. "Is it true," one should ask, "that such awful agony has been repeatedly inflicted upon animals by European physiologists, and that proof of their cruelties is based upon their own statements and reports? Can it possibly be true that not a single one of these accursed experiments has yielded to medical science any discovery of the least practical value in the treatment of disease? Is it true that no law prevents the repetition of these abuses in my own State? Is it true that such painful experiments are unnecessary for the attainment of medical knowledge and skill; that every year a host of physicians and surgeons graduate from the medical schools of England, Ireland and Scotland who never once in the course of their studies are asked to see an animal tortured that lessons may be remembered? Decision upon questions like these is not difficult; but let it be conviction based upon solid facts; for that alone has chance to be heard, or opportunity to be effective in results. Men will differ regarding the justification of

*Introduction, p. 7.

research where pain is not involved; but never need the advocacy of use bewilder us into blind condonation of revolting abuse. It is, then, solely to the creation of an intelligent public sentiment that we can look with hopefulness for the slightest mitigation or prevention of the evils deplored. Its evolution may be slow. But, once aroused, public sentiment in America is irresistible when based on Right; and before this tribunal no cruelty or abuse of scientific research can ultimately escape condemnation, and the stamp of atrocity and crime.

II. VIVISECTION IN AMERICAN COLLEGES.

Thus far we have examined the question of unrestricted experimentation as a method of medical instruction. That it would be confined to this purpose no attentive observer of the modern scientific spirit could for a moment believe. Once let it be granted that sentient creatures may be subjected to any degree of pain for the simple illustration of well-known facts, and it is certainly difficult to say why the practice should not be so extended as to gratify the scientific curiosity of anyone who desires to investigate the phenomena of life. Within the past few years a new aspiration has become prominent—the wish to penetrate to the very heart of Nature, and to pluck from thence each mystery which there lies hidden. Since for the future, one of the chief aims of scientific endeavour is to wrest from unwilling Nature her secret thought, we could have known for certainty, years ago, that this idea would not be confined within the walls of the medical school.

That which any careful observer of recent tendencies in thought might have foreseen, has actually occurred. Spurred by competitive rivalry into provision for the most advanced courses of instruction, hindered by no strong public sentiment, which should demand the least safeguard

against danger or abuse, nearly every great educational institution of America is widening the opportunity for its young men and young women to investigate the phenomena of living things,—not as an adjunct to professional study, but merely as a phase of that scientific training which in future is to form a part of a liberal education.

The change has been gradual and unobtrusive. In the printed catalogues of colleges we may find little note of the study of physiology; that, to-day, is merely a department of Biology, which includes within its scope not only the functions, but also the structure and development of all living creatures. The American university of to-day has no thought of fashioning itself after the ancient models of Oxford and Cambridge; its ideals are found rather in Germany or France. No American college at present reckons itself completely equipped without its biological laboratory, and its staff of instructors, conversant with the newest methods of foreign investigation.

Nor is the modern aim simply to teach students the gathered facts of previous inquiries. The new ideal would inspire students, not to believe, but to investigate. "Every encouragement is afforded to those who show aptitude for original research," is the frequently-recorded promise to the young inquirer. Let us take a few representative American Colleges, and note some of the advantages they are offering to the student of to-day.

HARVARD UNIVERSITY.—"Students working in the Physiological Laboratory study the various digestive and respiratory processes . . . and devote themselves to similar problems and processes."

YALE UNIVERSITY; COURSE 128.—"Huxley's Lessons in Elementary Physiology, with occasional lectures *and illustrative experiments.* . . . A course of lectures on

Experimental Toxicology* is open to students in the above course."

WILLIAMS COLLEGE.—"Anatomy is studied only so far as it may be necessary to an intelligent discussion of Physiology. An effort is made to exhibit *not only the results, but also the methods of physiological research.* . . . The new Thompson Biological Laboratory is a large building of four stories. The laboratory is well equipped with . . . all the appliances for general and advanced work."

TUFTS COLLEGE.—"The work in Biology begins with the study of Physiology, which is required of all students in the Classical and Philosophical Courses. . . . Subjects are taught by lectures and by laboratory work, the object being *to impart the scientific method,* rather than a large number of *unimportant facts* (!). "Provision is made for original investigations, and students will be encouraged to continue their work in this department (Biology) by means of research on special problems."

PRINCETON (COLLEGE OF NEW JERSEY).—"An advanced course in Biology has been established . . the objects in view being (1) *To foster a spirit of original research;* (2) to qualify advanced students to become teachers. It is not restricted to students who are candidates for a degree, if they possess sufficient elementary knowledge, to profit by the instruction. These courses are of a comprehensive and elastic character, and . . . *include much laboratory work under* the direction of the instructor."

SYRACUSE UNIVERSITY.—"Biology is required in all the courses during the third term of the sophomore year. To students showing special aptness there is opportunity for continuous work along special lines."

* Toxicology is the science which treats of poisons. But why need the students of Yale to learn the arts of Brinvilliers?

University of Rochester.—"Instruction is given by means of laboratory work, lectures, and recitations, especial attention being given to the first. . . . *Physiology: Experiments performed by the students individually form a feature of the course. Honor Studies: Experimental work on digestion and on the functions of nerves.* (Seniors.)"

Northwestern University.—(*Physiology.*) "The work consists of laboratory work, four hours a week, with weekly lectures upon comparative anatomy, amply illustrated by dissections *and demonstrations.*"

Cornell University.—"In all the courses laboratory work forms an integral part. With the general courses in Physiology and Zoölogy, one-third of the time devoted to the subject *is occupied on laboratory work or demonstrations.* In the advanced courses, laboratory work is proportionally much greater in amount."

University of Michigan.—"The courses in Physiology are arranged for those who intend to become physicians or dentists, those who propose to teach the subject, *and those who contemplate making Biology a specialty.* . . . In the laboratory, the student learns to use the apparatus *and methods employed in ordinary physiological experiments.* Advanced students are given an opportunity to begin research work. . . . The laboratories of the University are provided with the necessary facilities, not only for ordinary biological work, but for somewhat extended research, and *every encouragement is given to the students, especially in the last year, to devote themselves to original investigations.*"

Leland Stanford Jr. University (California).—"1. *General Anatomy and Physiology:* Laboratory work seven

and one-half hours a week through the year. . . . The laboratory work will give occasion to discuss many questions of general biology. 2. *Animal Physiology.* . . . Laboratory work five hours a week through the year. It includes an *experimental course in Physiology,* based upon Foster's 'Physiology' as the text. The Graduate Courses in Physiology and Histology will include the thorough study of some of the more recent treatises of various subjects in Histology and Physiology, *and a repetition of a sufficient number of experimental investigations to give a discipline in the methods of investigation.* . . . Students in this department will occupy the latter portion of their courses, mainly on some original research the subject of which is determined by previous training—*and their inclinations.*"

University of Chicago.—"*Autumn Quarter* (Assistant Professor Loeb): Original investigations in Physiology. Laboratory work in physiology of the sense-organs *and the nervous system. Winter Quarter:* Laboratory work in the physiology of circulation, respiration, and animal heat. *Spring Quarter:* Laboratory work in physiology of the nerves and muscles, and in general physiology. *Summer Quarter: Physiological Demonstrations.* It is the aim of this course to give to teachers in high schools and colleges an opportunity *to become familiar with the typical physiological experiments.*"

This is by no means a complete list, but it serves as a fair illustration of the position attained to-day by that spirit of scientific inquiry, which, within a quarter of a century, step by step, has forced its way into dominant ascendency over the old and long-established ideals of collegiate training.

In regard to most of the group of sciences included under the name of Biology, to the study of organization, of tissue

and development, there is no question of their vast importance and value. But the complete study of animal functions introduces the young student to another phase of investigation—*the observation of pain.* One may indeed learn all the truths of Physiology without this experience; but he must then be willing to accept facts upon others' testimony; and the new scientific spirit insists that personal investigation must supersede belief. For example, you may learn perfectly each and all of the functions of the nervous system, by the careful study of recorded facts. But suppose you demand that the recorded fact shall be emphasized "by experiment and opportunity for observation?" Then some creature must be put to an agonizing death to gratify your curiosity. Now how far is this method of study a permissible element in the training of young men at American colleges?

This inquiry is one of great importance. Here is no question of "cruelty," for the essence of that vice is the infliction of agony for amusement, the causation of wanton torment, of purposeless pain. No body acquainted with the earnest men who direct the science-teaching departments of our colleges, will for a moment fancy them guilty of aimless torture. But how far will scientific enthusiasm lead them on? To what extent do the university authorities in America permit the causation of pain, simply for purposes of illustration?

Let us make the question as definite as possible. One of the principal European experimenters to-day is Dr. Simon Stricker, of Vienna. Not long since I was told by a professor in one of the leading medical colleges of New York, that he had himself witnessed the most horrible tortures conceivable inflicted by this man upon living monkeys,—animals specially selected because in their dying torments their facial expression became so like to human agony! A European journal recently describes one of his class-

demonstrations, wherein he destroys the spinal cord of a dog by thrusting a steel probe into the spinal column, producing, we may say, the most atrocious torture it is possible to conceive. The animal evinced its agony by fearful convulsions; but it was permitted to utter no cry that might evoke sympathy, for previous to the demonstration its laryngeal nerves had been cut! No vivisection could be more utterly unjustifiable or more fiendish in atrocity. And yet with entire and perfect good faith this demonstrator might have repeated the well-worn formula, that he was "careful to inflict no *unnecessary* pain." "I know," said Herr Stricker, on one occasion, "that this experiment will seem cruel; but it is 'necessary' that my hearers should have its effects impressed on their minds!" Surely, there was never more fit example of Milton's words:

> "So spake the fiend, and with Necessity,
> The tyrant's plea, excused his dev'lish deeds."

Now for this same reason, merely as a method of teaching, what prevents that demonstration-experiment of Stricker from being regularly repeated before young men and young women in the leading colleges and universities of the United States?

We are indebted to a distinguished member of the medical profession, Dr. Ballou, of Providence, R. I., for information which seems to afford a complete answer to this question. Desiring to ascertain whether any restrictions, hindering the use of torture as a means of illustration, had been imposed by those having control of our educational institutions, he wrote to the presidents of certain representative American colleges, asking them whether any regulations existed, defining or limiting the extent to which living animals might be subjected to painful experiment in the College laboratory. In nearly all cases the inquiry was accompanied by special reference to statements in the

printed catalogue, and the correspondence therefore seems to have varied somewhat in phraseology, although the leading question was invariably the same. The following letter is fairly representative of this request for light:

"To the President of THE UNIVERSITY OF CALIFORNIA.

"DEAR SIR: Referring to your 'Register' and to the outlines of biological studies there presented, may I ask whether the University of California, by any written instructions, *has placed any limitations to painful experimentation upon living animals?* Are students . . . . permitted to carry their investigations *to any extent* inclination may suggest? In this matter, in short, does the University regard it best to leave all questions as to methods of research solely to investigators themselves—pupils or instructors?"

The following extracts are from some of the replies he received. The italics are my own.

From REV. DR. TIMOTHY DWIGHT,

President of Yale University, New Haven, Ct.

. . . "In answer to your letter of the 14th I would say that we have had no occasion to lay down any definite restrictions as to the matter to which you refer, as we have entire confidence in the professors having special charge of the courses of study in physiology. . . .

TIMOTHY DWIGHT."

From CHARLES W. ELIOT, LL.D.,

President of Harvard University, Cambridge, Mass.

"Original research in Biology and allied branches *is not limited in any way* at this University. The instructors take all responsibility regarding methods of research. The students work wholly under the direction of the instructors, and have no discretion as to methods employed.

CHARLES W. ELIOT."

From Rev. Dr. Francis L. Patton,

President of the College of New Jersey, Princeton.

. . . "The College of New Jersey has *not* defined or limited, so far as my knowledge goes, the extent to which living animals may be subjected to pain. . . .

Francis L. Patton."

From James R. Day, D.D.,

President of Syracuse University, N. Y.

. . . "In reply to your first question would say that there are no written restrictions.

"We leave the decision to the judgment of the investigator.

James R. Day."

From James B. Angell, LL.D.,

President of the University of Michigan.

"The methods in use in our biological laboratory are those ordinarily employed, I think, elsewhere in similar institutions; but students are not permitted to work on living animals except under supervision. . . .

James B. Angell."

From William R. Harper, Ph.D., D.D.,

President of the University of Chicago, Ill.

. . . "We have not thought it wise to place *any restriction* upon experimentation involving prolonged or severe pain. . . .

Wm. R. Harper."

From Rev. Dr. Charles F. Thwing,

President of the Western Reserve University.

. . . "In answer to your courteous inquiry, I beg to say that a professor who is worthy of being made the head

of the Department of Biology is certainly worthy of deciding the important question which you ask.*

CHARLES F. THWING."

From CHARLES KENDALL ADAMS, LL.D.,

President of The University of Wisconsin.

. . . "There are no rules or regulations limiting our professors of zoölogy in the matter of vivisection. I have the impression that all the authorities of the University have confidence that our professors will not use their privileges in an improper manner.

C. K. ADAMS."

From G. A. GATES, LL.D.,

President of Iowa College, Grinnell, Ia.

. . . "The College authorities have never had occasion to take any action in the matter. Personally, I should leave it to the judgment of the instructors, or else change instructors.

G. A. GATES."

From HENRY WADE ROGERS, LL.D.,

President of Northwestern University, Evanston, Ill.

. . . "The University authorities have not, by any written regulations, defined or limited the extent to which living animals, used for experiment, may be subjected to pain. We have felt that the matter could be safely left to the discretion of the preceptor. . . .

HENRY WADE ROGERS."

* What test of "worth" would Rev. Dr. Thwing apply? Professor Gad, of Berlin, obtained a year's leave of absence during 1893–94 for the purpose of "regulating" the physiological courses of instruction at the Western Reserve University. If Professor Gad is "worthy," why might not Professor Stricker be regarded as worthy to succeed him as a teacher of foreign methods?

From Rev. Dr. Elmer H. Capen,

President of Tufts College, Boston, Mass.

. . . "The methods of doing work in the several departments is left to the discretion of the individual instructors. In reference to the Department of Biology, I have never known of experiments involving *needless* pain to the lower animals.

E. H. Capen."

From David Starr Jordan, LL.D.,

President of Leland Stanford Jr. University.

. . . "In matters of this kind, I am decidedly of the opinion that *no restrictions should be put upon the student* except those which the professor may lay upon him.

David S. Jordan."

From Franklin Carter, Ph.D., LL.D.,

President of Williams College, Williamstown, Mass.

"We have not laid down any restrictions in our biological work, on our teachers. The principle in the College has always been in every department *to trust the professor wholly,* unless there seemed reason for distrust.

Franklin Carter."

From J. G. Schurman, D.Sc., LL.D.,

President of Cornell University, Ithaca, N. Y.

"President's Room,
Cornell University, March 8th.

"All experiments, in the courses in Physiology, are upon animals just killed or completely anæsthetized.*

J. G. Schurman."

* The question asked was not answered.

From Rev. Dr. William De Witt Hyde,
President of Bowdoin College, Brunswick, Me.

"The College has *no rules or regulations* on the subject of experiments in Biology.

Wm. D. W. Hyde."

From Isaac Sharpless, Sc.D., LL.D.,
President of Haverford College, Haverford, Pa.

"Haverford College, Pa.

. . . "Our trustees have forbidden any vivisection in our laboratory. We do not find this a serious disadvantage, though we have to omit certain lines of research.

J. Sharpless."

In a few instances the letter of inquiry was referred by the president of the college to the Professor of Biology. Some of the replies received from this source were as follows:

"Biological Laboratory, Hamilton College, N. Y.

. . . "I am glad to say that no restrictions have been placed upon the experimental work of this department. The most painful experiments have been omitted. . . . Anæsthetics are used in the few experiments tried, and the animal is not allowed to recover consciousness.

A. D. Morell."

"Oberlin College, March 5th.

. . . "I think that the judgment of preceptors and of really advanced pupils should be trusted in such matters.

Albert A. Wright."

"University of California, March 9th.

. . . "Your letter to President Kellogg, making certain inquiries about our work in Biology, has been handed to me for replying. I beg to say that the University of California employs instructors whose judgment it is willing

to trust concerning the matter to be taught *and the methods of teaching it.* It does not, consequently, deem it necessary to exercise a censorship over them, either in the biological or any other department.

WM. E. RITTER, Asst. Prof. of Biology."

"AMHERST COLLEGE, Mass.

. . . "Thus far, the professor has had the power to decide what sort of work should be done in zoölogical laboratory, and under what conditions it should be done. . . . *The trustees have undoubtedly power to make and enforce whatever rules and restrictions may seem best to them.* They have never, to my knowledge, made any attempt to modify my modes of laboratory work.

"I neither perform, nor allow any student to perform, any experiments involving vivisection in the laboratory. . . . . In very simple physiological experiments, such as showing the circulation of the blood, I always etherize the animal thoroughly, and then use the time of complete insensibility preceding death for demonstration.*

JOHN M. TYLER."

It is evident therefore that in the majority of American universities and colleges there are no restrictions governing or limiting the infliction of pain. The judgment of the professor is the only guide; his wish, the only limitation. That which in England would be a crime, in America would not be even the infraction of a college rule. The freedom which prevails in the physiological laboratories at Vienna, Berlin, and Paris has quietly taken root in our American universities. One hesitates to believe that the atrocities of torture which have so often stained methods of research on the Continent have been duplicated in the physiological labora-

* Prof. Tyler's definition of "Vivisection" evidently does not cover "simple physiological experiments."

tories of any American college; *but the opportunity is there.* As a method of teaching, no present impediment prevents their introduction at any time.

Nor is it reassuring to note the apparent unwillingness of teachers of Biology to have freedom of action limited by any restrictions hindering the infliction of prolonged or excruciating pain. This repugnance one might expect in medical schools; but it is startling to find it in schools of science and art, where no plea of "beneficent utility" can be brought forward. I do not understand this extreme sensibility. Doubtless the Czar of Russia prefers unlimited power to the restrictions of a written constitution; but absolutism, whether on the imperial throne or in the physiological laboratory, has not offered to the world any high type of conduct. What, for instance, would be thought of the president of a great and wealthy university who should proclaim that, as regards the expenditure of the treasurer, no restraints or restrictions were ever imposed; that complete confidence in personal character took the place of all vouchers and receipts? What opinion should we hear of the college treasurer himself, who refused all demand for detailed statement of his accounts, as "a grave reflection upon his character?" There is not an institution in the land where such financial mismanagement would not be condemned. Yet why so many precautions against prodigality of money, and such acute sensitiveness toward the slightest impediment against prodigality of pain?

What may be done? The first step is to convince those who govern the policy of our institutions of learning that here, too, is need of judicious surveillance and control. If every American college were to adopt merely the restraints which characterize the statute law of England on this subject, the condition would be far better than the immunity that now prevails. Or, go yet a step farther. What consistent objection is there to a college regulation or law that

should forbid altogether those laboratory experiments or demonstrations which cause the infliction of any pain beyond that incident to the most humane method of taking life? At Hamilton College, New York, no experiments are made upon conscious animals. At Cornell University we are authoritatively informed, "the utmost pain inflicted" is the instantaneous killing of a frog. If Science-teaching there does not suffer from this self-imposed restraint, why should not such praiseworthy custom be made in every college the imperative rule? Unnecessary? There never yet was unlimited opportunity, that did not, in the end, witness most grave abuse.

We are almost at the beginning of the twentieth century. Civilization is about to enter a new era, with new problems to solve, new dangers to confront, new hopes to realize. It is useless to deny the increasing ascendancy of that spirit which in regard to the problems of the Universe, affirms nothing, denies nothing, but continues its search for solution; it is equally useless to shut our eyes to the influence of this spirit upon those beliefs which for many ages have anchored human conduct to ethical ideals. Regret would be futile; and here, perhaps, is no occasion for regret. To the new spirit which is perhaps to dominate the future, this longing for truth, not for what she gives us in the profit that the ledgers reckon, but for what she is herself, this high ambition to solve the mysteries that perplex and elude us, the world may yet owe discoveries that shall revolutionize existence, and make the coming era infinitely more glorious in beneficent achievement than the one whose final record, history is so soon to end.

But all real progress in civilization depends upon man's ethical ideals. Infinite responsibility for the moral impetus of the next generation rests to-day on the shoulders of those who stand at the head of institutions of learning wherein are created and fashioned the aspirations of young

men. What shape and tendency are these hopes and ambitions to assume in coming years? What are the ideals held up before American students in American colleges? What are the names whose mention is to fire youth with enthusiasm, with longing for like achievement and similar success? Is it Richet, "bending over palpitating entrails, surrounded by groaning creatures," not, as he tells us, with any thought of benefit to mankind, but simply "to seek out a new fact, to verify a disputed point?" Is it Mantegazza, watching day by day, *"con molto amore e patienza moltissima"*—with much pleasure and patience—the agonies of his crucified animals? Is it Brown-Séquard, ending a long life devoted to the torment of living things, with the invention of a nostrum that earned him nothing but contempt? Is it Goltz of Strassburg, noting with wonder that mother-love and yearning solicitude could be shown even by a dying animal, whose breasts he had cut off, and whose spinal cord he had severed? Is it Magendie, operating for cataract, and plunging the needle to the bottom of his patient's eye, that by experiment upon a human being he might see the effect of irritating the retina? Is it Stricker, making a tortured ape to mimic the agony of a dying man?

These men, it is true, Science counts among her disciples. They reached fame through great tribulation, through agony that never can be reckoned up, but it was not their own; through "sacrifice," indeed, but not self-sacrifice; through abnegation of compassion, by suppression of pity. Surely in these names, and such as these, there can be no uplift or inspiration to young men toward that unselfish service and earnest work which alone shall help toward the amelioration of the world. "The old order changeth," but are there not some ideals of humanity that do not waver with the passing years?

Perchance the curiosity of Science will one day spend itself. The last evasive and evading mystery of Life may

not be wrested from nature by fire or steel. Then there may be names that Humanity will forget, or remember only to execrate. But whenever in time to come, men shall long to lessen in some way the awful sum of ache and anguish in the world, will they not rather turn for their inspiration to those ideal examples of self-sacrifice which still encourage us; to Howard, risking life in prison and lazar-house, that by revelation of their infamy he might stir the conscience of Europe to the need of reform; to Wilberforce and Clarkson, toiling amid obloquy and abuse for more than twenty years to put down the African slave-trade; to Garrison, waging war for thirty years that he might help to free America from the stain of human bondage; to Shaftesbury, confronting the organized greed of England in his effort to protect children in coal mines and factories; to Arnold Toynbee, making his home amid the squalor and wretchedness of Whitechapel, that he might know by hard experience the bitterness of life for the London poor. Are not these better examples for the emulation of youth than those devotees of research whose pitilessness is their supreme title to the remembrance of posterity? Surely, from their eternal serenity, they would whisper to us, if they could, that the right path to the world's amelioration is not by way of torture; that our closing century will not see the end of great opportunities for helpful work; that while poverty, war, preventable disease and unmerited suffering yet afflict the world, it will not cease to need the sympathy, the devotion, and the self-sacrifice of earnest souls.

THE RESTRICTION OF VIVISECTION.

An article on "Vivisection," which recently appeared in *Our Dumb Animals,* is one of more than passing interest. It is the judgment of an eminent philanthropist upon the present aspect of a great problem, the restriction of experiments upon living animals. With the majority of his conclusions nearly every reflecting mind would certainly agree. His tribute to the medical profession is as appreciative as it is just and well deserved.

The third proposition which he advances by no means appears to me perfectly clear. Is it, then, absolutely certain "that no law opposed by the great mass of the medical profession and the leaders of our medical schools can ever be enacted, or, if enacted, would ever be enforced?" If such a law has been passed in Great Britain against the protest of the medical schools, why is it so absolutely impossible in any of the United States?

Dr. Macphail, in his essay in favor of vivisection, asserts that the existing restrictions to this practice in Great Britain compelled those who practiced vivisection to flee to France and Germany, and to draw upon the United States; for as he tells us truly, "in the United States there is really no restriction placed upon vivisection." Some of the medical schools of England did not like a law which enacted that experiments must not be performed for a demonstration without the use of anæsthetics; but the law was passed and is obeyed—Dr. Berdoe admits—"about as well as any other law." What, then, prevents the enactment of a similar law in this country? Nothing, except that public

* From "The Christian Register," 1894.

sentiment does not yet demand it. If ever enacted, I dare say it will be as strictly observed at Harvard University as at London and Oxford.

The plan of petitioning the medical societies of Massachusetts for their views on vivisection will result, of course, only in another presentation of its necessity. So much is certain in advance. Yet I wish it were possible for the American Humane Education Society to stand in the attitude of a teacher rather than a pupil, and, reaching its own independent conclusions respecting the practice, to urge them upon the members of the medical profession. Suppose that some Boston anti-slavery society of forty years ago, in despair of accomplishing good by the vituperation of agitators like Mr. Garrison, had concluded that negro slavery could never be abolished against the belief and conviction of the religious and moral portion of Southern communities, and had decided to send petitions to the Methodist Conference of Georgia and the Presbyterian Synod of South Carolina, asking their views on the expediency and necessity of human bondage. I can imagine these petitions referred to most excellent committees, consisting of Southern clergymen of unblemished character and of national reputation. Yet does any one question what would have been the reply of the clergy of Georgia or South Carolina in 1850 as to the morality of slaveholding? Does any one doubt what will be the answer of the Massachusetts Medical Societies to the questions referred to them? Human nature is not different in Massachusetts and South Carolina. Some day I hope a book may be written giving the opinions of great and good men in favor of customs, institutions and laws which, in spite of their advocacy, civilization has swept out of existence.

It is now about fifteen years since the agitation against the practice of vivisection began. In America what has it accomplished? Certainly it has not prevented the great

increase of the practice. I dare say there are twenty times as many vivisections to-day as there were, say, in 1878. In almost every one of the great medical colleges in the United States experiments are shown which are criminal in England, Scotland, and Ireland. In no State has public opinion yet risen to the demand for legal restriction of any kind. It seems to me that these failures should suggest a change in policy, and a concentration of purpose and effort in a new direction. Why can we not unite in an attempt simply to lift the moral sentiment of American States such as Massachusetts, New York and Pennsylvania to the humane level of England and Scotland, through the legal abolition of all painful experiments before students merely to illustrate facts already known? When we have attained to the civilization of Great Britain in this respect, will it not be time for us to seek to surpass her? We have not yet in a single American State risen to her level of supervision, restriction, and control.

Upon the expediency of the total repression of all experiments on animals, painful or not painful, there is a difference of opinion. But surely, something might be done to lessen that needless torture which, as a custom, is spreading everywhere in America, unchecked. Is it not worth trying for? Not long since I listened to the experience of a young woman, who, with the ambition to devote her life to the relief of suffering, had been studying to be a physician in one of our great medical schools. She, to whom the fluttering of a caged bird excited a thrill of pity, had compelled herself to look upon the waste of life in the physiological laboratory, had forced herself to witness the exquisite agony, the prolonged torture of living animals, which constitutes a part of the medical teaching in this country to-day. For example, it was affirmed on one occasion by the professor of physiology before his class of young men and women that the fur of animals prevents the radiation of

animal heat, and is thus a protection from cold; that, moreover, an animal deprived of its fur, or with that fur rendered useless by a coating of varnish, would actually suffer if exposed to extreme cold. Nobody out of a lunatic asylum ever doubted this wonderful assertion. Every young man and woman in the medical school knew it as perfectly as the professor himself. But, in the present civilization of America, there is nothing so satisfactory in the science teaching of certain institutions as an experiment with torture, for nothing is cheaper than pain.

Three rabbits were produced, one naked, sheared of its fur, one similarly treated and with its body varnished, the third retaining its natural protective covering; and the three animals were then packed in ice. No anæsthetic was given; the "exhibition of pain" is an element in the success of such an experiment. Little by little the moans of the freezing animals grew fainter, and after a time ceased altogether. Then they were unpacked. What was the result? Precisely what might have been anticipated. The demonstration was a "success." One rabbit, varnished, had been frozen to death. Two others, congealed into partial insensibility, were soon resuscitated, and "reserved for other experiments."

I confess I do not understand how such an illustration as this is "essential to the progress of medical science," or practiced "only with a view to the prevention of human or animal suffering." It proved nothing that was unknown before. It demonstrated no facts that any student would have hesitated to believe on the authority of his text-book. The reason why we teach with torture is merely, as I have said before, because nothing else is so cheap. It is experimentation of this kind, so cruel in action, so brutalizing in tendency, so void of utility, that should be abolished by law, and made as criminal throughout the United States, as it is in Great Britain to-day.

*AN ETHICAL BASIS FOR HUMANITY.**

Not long ago, I found myself in London, standing with uncovered head before what seemed the figure of an old and venerable man, seated in an armchair and dressed in the quaint costume of sixty years ago. Without close inspection the visitor would not suspect that behind that face was a human skull, or that beneath those faded garments was an articulated skeleton. Nowhere on earth is there a more singular tomb than this of Jeremy Bentham the English philosopher and philanthropist, to whom belongs the honor of having advocated the rights of animals forty years before the first step to their legal protection was taken by any government in the world.

It is a strange yet instructive story. The old man's life had been wholly devoted to humane ends. Approaching death at the ripe age of eighty-four, he found popular prejudice roused to the highest pitch against the study of human anatomy by the dissection of the dead. Graves were found desecrated, murders had been committed, doctors were mobbed, riots were frequent. The situation was peculiar. Here was a study absolutely necessary as the foundation of medical science, yet one which is regarded with abhorrence by the vast majority of those who are to profit by its revelations. The great objection in the popular mind was that Science paid respect to the prejudices of the rich, and sought material for her researches only among the bodies of the poor.

"But what right," asked Bentham, "have you or I to insist that the body of the poorest outcast shall be sub-

*Read before The Humane Congress of the World's Columbian Exposition, Chicago, Oct. 12, 1893.

jected to what we abhor? Upon what ethical basis shall I suggest the tacit demand that the pauper shall make a sacrifice to science which I decline to make myself?" And so the aged philosopher determined to undergo, for the benefit of his fellow-men, a renunciation which has few counterparts in history. By written directions, the philanthropist bequeathed his dead body to the investigations of science, in whose temple—and not the grave—it rests to-day.

It was in that presence, pondering on that strange abnegation, that unique sacrifice, that there came into my mind an answer to a problem which had long perplexed me. That perplexity I propose to state; and at the same time to define the doctrine under which, for myself, it wholly disappeared.

This is the problem: *To what ethical principle or rule of right and wrong may mankind, at all times, confidently appeal for the determination of the quality of conduct toward the lower animals?*

To make the question practical and definite, let me suppose myself a physiologist, an amateur investigator into certain curious problems of life and death, and that for a trifling sum I have become the possessor of a half-grown dog. Bone and sinew, brain and nerve, intelligence and sensibility —it belongs wholly to myself. Over it my power is nearly absolute; I may sell it, give it away, or kill it by ordinary methods whenever I please.

But suppose I wish to go farther. In my studies I have adopted a theory regarding the action of certain nerves, differing somewhat from that usually accepted; and I wish to demonstrate this hypothesis to a friend by means of an experiment upon my dog which will involve, necessarily, the infliction upon it of prolonged and excruciating pain. Perhaps it will be necessary to invoke human ingenuity in order to protract, as far as possible, its suffering and existence. It is a custom sometimes to prepare for a physiologi-

cal demonstration several hours in advance. There is to be made an experiment on Monday morning, let us say; and so on Sunday afternoon, while all the Sunday schools of a vast city are teaching children their duties to God, the man of science has been known to stroll to his laboratory, to cut at leisure through the living tissues, to set in motion the machinery for maintaining artificial breathing, and then to leave the creature, as in a vice, to a long night of suffering and fear until "wanted" the following day. This procedure also, I propose to copy. Now, what shall constrain me? To what influence will you appeal that I restrain myself?

Do you tell me at once that this is a "vivisection" and therefore must be wrong? But suppose I refuse to admit your conclusion? "Is it, then," I reply, "wrong for me to pull to pieces this flower which I have just plucked from the parent stem? Is it a sin to cut a living tree? These also are 'vivisections' in one sense."

"Ah, but the animal feels pain."

Is that your only objection? Do you, then, never cause an animal to suffer pain for your convenience?

"But in killing a seal for its fur, or a lamb for its flesh, the animal is subjected to no more pain than is necessary," you reply.

Very good; I also agree,—(and I smile to think how many feebly protesting and half-awakened consciences this very promise will put at once to sleep again),—I promise also to inflict no "unnecessary" pain.

"But your experiment will be absolutely useless."

Yes, so far as the treatment or prevention of disease is concerned; but suppose I do not admit that the gratification of my scientific curiosity on any point is absolutely useless to myself, if a certain intellectual satisfaction is thereby secured?

Now what will you do? Will you invoke the law? But

so long as I keep within certain easy formalities there is nowhere in America the slightest restriction to physiological experiments, no matter what degree of pain or prolongation of suffering they may involve.

Will you appeal to religion? Why, there is not a creed in Christendom which clearly teaches as a dogma of religion, even the simple duty of mercy to animals! Where will you find it in the Thirty-nine Articles of the Church of England, or in the Westminster Confession of Faith? I once ventured to call the attention of Cardinal Manning to a statement of Philip Gilbert Hamerton, who had asserted that the Catholic church denied the existence of any duties to creatures beneath us, and the cardinal's reply was favorable only so far as this; that "the Catholic church has never made any authoritative declaration as to our obligations to the lower animals." I do not dispute certain inferences we may be entitled to draw from the precepts of all religions; but in respect to positive obligations the creeds are silent, one and all.

Would you invoke public sentiment? It will fail you. Only let me use the pacifying shibboleth of certain writers, and claim that all of my investigations are in the general line of researches made to "mitigate human suffering and prolong human life," and there is hardly any extremity of torture which the public opinion of to-day will not sanction and excuse.

Shall pity be expected to restrain me? But suppose I have lost the capacity for pity, when my ambition to discover something is once aroused? It has happened to others. Like Dr. Klein of London, I may have come to "have no regard at all" for the sufferings of my victim; "no time for thinking what the animal will feel."* It is related by Dr. Latour of Magendie that at one of his public lectures a dog upon which he was making one of his

* Dr. Klein's answer before the Royal Commission (Query 3,539).

most cruel experiments, twice escaped from under the implacable knife and threw its paws about Magendie's neck, pleading in the only language it knew for a little mercy; yet none the less was it sacrificed that the ambitious scientist might demonstrate for the hundredth time an abstract theory. Seneca tells us that when Parrhasius, the greatest of Grecian artists, was painting his "Prometheus torn by a vulture," he caused a captured prisoner of war to be tortured to death in his studio, that he might copy from nature the expression of agony; and musing above some mutilated victim whose sad eyes make mute appeal for pity, I can fancy some Mantegazza or Brown-Sequard to make reply:—

> "Pity thee? So I do;
> I pity the dumb victim at the altar,
> But doth the robed priest for his pity falter?
> I'd rack thee though I knew
> A thousand lives were perishing in thine;
> *What were ten thousand to a fame like mine?*"

Will science assist one? Not by any suggestion of ethical restraints, for she knows none. Her only function is to discover and to reveal the hidden facts of existence—to sift the Knowable from the Unknown. Yet within the lifetime of most of us, has not science invested this whole question with a new aspect? For eighteen centuries of Christian civilization the wisest and best of mankind looked at the under-world of animated nature as beings not only different from ourselves, but infinitely beneath us in origin and destiny. Now modern science has promulgated a new doctrine. No theory is more firmly held by biologists to-day than that hypothesis of Darwin which derives from the same far-distant ancestry both animals and man. Only a few thousand years ago, and your ancestors and mine were the lowest type of savage barbarians, dwellers in caves, clothed in skins: almost indistinguishable—except by the guttural elements of vocalized speech—from the animals they hunted

and upon which they fed. But science tells us even this was not the beginning.

"Carry your imagination still backward into the awful abyss of uncounted ages; and there was a time when even your ancestors, O professor of biology, and those of the dog beneath your knife, were of the same species of living creatures," speaks the Science of to-day. "Out of the same black darkness, struggling for existence, you have emerged—in far different form, but yet closely related, not only by origin but in every function of organized existence! That quivering nerve acts precisely as your nerves would behave under like excitation, and it will feel the same anguish yours would feel. That brain you are about to penetrate, hides in some infinitely mysterious way the germs of mind; the elements, at least, of intelligence, obedience, reverence, contrition, faithfulness and unselfish affection. Ah, sir! your keenest knife cannot lay bare these mysteries, nor find the chambers of the soul where these lie hid; your most potent microscope will somehow fail to reveal the substance of that love, devotion and fidelity which sometimes seem almost to surpass our own."

So much, indeed, Science may tell us. "These despised beings are your kindred," she asserts. Whether our conduct toward them is right or wrong is a question beyond her province to decide.

Yet if all these fail us, where shall we look? It seems to me that the decision of ethical questions like this can rest only upon some formula of absolute justice which mankind shall gradually accept as the philosophical expression of the highest excellence. For, in the end, we are governed by our ideals. What is duty? Simply the highest ideal of action. In every age, there have been conceptions of righteousness nobler and better than the average of human conduct. Toward these ideals, recognizing their justice, Humanity gradually advances. The scoff of one period becomes the

formulated law of another. No great reform has ever been carried through, which at the beginning was not greeted with derision and stigmatized as a glittering but impracticable dream.

Now I think it is a fact accepted by every school of philosophic thought, that in the determination of the ethical righteousness of our relations to one another, no higher test has ever been proposed than that golden rule, first formulated five centuries before Christ, which defines as the ideal of conduct that we treat others as we would have others treat us. In Book XV of the Analects of Confucius we read that one of his disciples asked him, saying, "Master, is there one word which may serve as a rule of practice for all one's life?" The master answered: "Is not *reciprocity* such a word? That which you do not want done to yourself, *do not to others.*"

When, later, this precept was enunciated by the Founder of Christianity, who can begin to estimate its potency in the stimulation of that humane sentiment, that pity for suffering, which underlies our modern civilization? Imperial Rome was more magnificent than our grandest metropolis; but what an infinite chasm separates the Roman amphitheatre, where worn-out slaves were thrown to wild beasts, from the hospitals and dispensaries of Chicago or New York! Under the Coliseum is one ideal; under the Maternity Hospital is another; the ideal makes the difference in the two forms of civilization. It is needless to say that our lives do not wholly conform to our ideals; does that nullify them? Above the most selfish of our acts is ever the nobler possibility of unselfishness. "Strive to do good," says the preacher. But it does good to strive.

I believe, therefore, that with the increasing development of moral sensibility the time is approaching when humanity, accepting what science reveals of our common relationship and origin, shall make the ideal basis of conduct to the entire

animal creation, some paraphrase of this same rule. Its expression as a formula will perhaps be something similar to this:—

"Our moral duty to all living creatures, from the highest to the lowest form of life, is to treat them precisely as we ourselves should be willing to be treated for the same objects in view, were we instantly to exchange with them every limitation and circumstance of their condition and form."

Is this a practicable rule? How will it work in daily life? In the exercise of our supremacy over the animal world three phases of conduct are subject to question: their slaughter for our uses, as for food or fur; their torment or destruction solely for amusement and sport, and that experimentation upon them for scientific purposes, known as vivisection. How would each phase of conduct be affected were it governed by that formula of ethics I have ventured to suggest?

I. In the first place, it will not mean the abrogation of the right of the higher intelligence guided by ethical ideals *to decide what is best.* We do not regard it as a contravention of the golden rule that truant schoolboys are severely punished, or that the jailer keeps well guarded his prison gates. Not what they might selfishly wish is the rule; but rather what, under clearer light, even the schoolboy or the criminal would acknowledge as justifiable and right. For this reason, I am disposed to think that man's right to terminate painlessly the existence of beings below him for sufficient reasons, will not need to be abandoned. We think of death from the standpoint of personal deprivation; but to an animal it means cessation of no high purposes, of no great hopes, and, generally speaking, of no strong attachments. It is merely a slight abbreviation of existence; a termination which *may* be made far more painless than the exit by disease. Still I do not disguise from myself the hope that the time may come when the substitutes for flesh as food shall be so universally pro-

curable, so cheap and abundant, that the human race will attain to a far higher ideal than is generally held to-day, and refuse to sacrifice any life merely for the gratification of appetite.

II. While I can easily bring myself to the conception of a willingness to yield mere existence for the actual necessities of beings almost infinitely higher than myself, yet it becomes quite another matter when I try to imagine a consent to suffer—even in the lowest forms of life—the least useless pain. I cannot do it. Judged from this standard of ethics, all forms of so-called "sport," all that destruction of animal life merely for savage amusement and delight in killing something—must be regarded as immoral; and, ceasing to minister to our depraved pleasure, will in time disappear. That cruel sacrifice of song birds to the evanescent fashions of feminine adornment is not one that woman can justify to herself by this ideal of right and wrong.

Much that to-day accompanies the killing of animals for food, will sometime be deemed unnecessary and morally wrong. If society decides that for man's benefit it must continue to take the life of animals, death will then be inflicted with the utmost precaution against the addition of one needless pang. Should it be impracticable to kill any creature except by the possible addition of extreme agony, we shall cease to use it as food. When we have learned to govern conduct by some higher ideal than now, we shall not fry living crabs, or roast live lobsters. You tell me, laughingly perhaps, that such creatures do not feel pain very acutely; *but how do you know?* In their place would you take the chance? Science cannot do more than give a guess. To the possibility of such pain as death by fire implies, I do not think I have the ethical right to subject any living creature; for they are chances for suffering that for no conceivable gratification to another would I take on myself. And with butchery in

other ways, there is vast need of reform; not only as regards the needless suffering of animals on cars or cattleships, in transit from the pasture to the shambles, but also at the shambles themselves. It will all assuredly be remedied as the conscience of humanity awakens at last to a keener appreciation of the evils that exist.

III. We come finally to the question of scientific investigation. How will it be affected by appeal to any standard of conduct based upon the golden rule?

It will be seen at once that the problem we have vainly attempted to solve by appeal to religion, to law and to science, finds immediate solution if tried by the suggested test. Can we imagine that the physiologist ever lived, who, under the form of "our humble cousin the orang-outang" (to use Professor Huxley's significant designation), would be willing to suffer prolonged agony and death, merely to demonstrate to students or others, facts which are beyond all question or doubt?

Changed by some magic wand of Circe to the similitude of a dog or cat, would not the most ardent investigator protest vigorously, if he could speak, against the injustice of using *his* nervous system for the torturing experiments of Mantegazza or Brown-Sequard, when such investigations, however "original," have no conceivable connection with the alleviation of human ailments or the treatment of disease? When Chauveau "consecrated" to extremest torture more than eighty domestic animals, chiefly horses old and worn out in man's service, to gratify his curiosity, and confessedly without the slightest idea of any practical benefit, we cannot dream of *his* willingness to be sacrificed like his victims for a purpose so insignificant, for results so absolutely useless. In the physiological laboratories of Europe and America, I doubt not that myriads of sentient creatures are made to taste all the physical bitterness of death that can be felt or conceived, in experiments that before some future tribunal

of conscience will be universally judged as crimes against justice and mercy, for which there exists no palliating excuse.

Before this ideal of conduct, then, would all scientific inquiries involving the death of animals, be wholly and unequivocally condemned? Do cases ever arise where living creatures, such as a rat, a rabbit, or a guinea-pig are subjected to experiments which the investigator could honestly be willing to endure for the same object, were his human shape and circumstances to dwindle to the limitations of the animal? The question is not an easy one; but, personally, I believe such cases exist. For while we arraign before every ethical ideal the cruel curiosity that forgets the pangs it inflicts, it is but justice to remember that all investigation is not synonymous with torture, nor even synonymous with death.

But how far are the leading physiologists of our time from even imagining the existence of limitations—and least of all, of any limitations founded upon a conception of the ethical rights of animals, or of altruistic ideals! In the presence of abuses which infiltrate the whole practice of scientific research; in a land which tacitly sanctions the yearly repetition of the worst atrocities of vivisection, without supervision, without record, without control, simply that the sight of torture may help stupidity to remember what science affirms, it seems to me useless on this occasion to discuss the permissible limitations of a practice that thus far refuses to consider or to submit to the slightest legal oversight in any American commonwealth. The great, practical need of the hour in regard to vivisection seems to me the creation of an intelligent public sentiment which shall at least recognize the existence of abuse, and upon that recognition build reform.

Can this ideal standard for the regulation of conduct toward the beings below us, be made practically applicable

in our daily lives? May I suggest your personal experiment with it as far as you can go? Surely in the perplexities of decision between right and wrong, we shall not wander far astray if in our hearts we carry that sublimest prayer,

"Teach me to feel another's woe,
* * *
That mercy I to others show,
That mercy show to me."

Eighty years ago, when Lord Erskine arose in the British Parliament to suggest and advocate a law protecting domestic animals from wanton cruelty, he was greeted with shouts of derision and contemptuous applause. In remembrance of that mockery, which now seems so strange to us, one may take refuge, while suggesting that at some future day, man's highest ethical ideals may include within their scope the conduct of humanity toward the entire animated world.

*PHYSIOLOGY IN OUR PUBLIC SCHOOLS.**

The American Humane Association has recently issued a circular calling the attention of the public to certain methods of instruction in our public schools, whereby the facts of physiology are set forth by means of actual experimentation upon living creatures, or by the dissection of such animals, killed for that purpose only, and often in the presence of the pupils themselves. The statement that any such practice really existed, met at first with general incredulity. Even if vivisection were practised, it seemed improbable that children of public school age should be required to become familiar with the process of mutilation and the phenomena of death.

The practice, we now know, has been actually introduced in certain schools. In one sense the motive was right enough. No doctrine has been more sedulously inculcated during the past twenty years than that the basis of all knowledge is observation and experiment. To accept any statement on another's testimony, when you can see the facts for yourself, is considered a sort of treason to the modern scientific spirit. No one thinks of teaching the phenomena pertaining to heat and light, to electricity and gravitation, for example, without illustration by some simple experiments. "Why, then," asks the enthusiastic young teacher, "should not all that varied phenomena of Life and Death which pertains to physiology be taught to young pupils in the same scientific way?"

There are two strong reasons why such methods of teaching should be strenuously prohibited in every school.

* From "Journal of Education," Boston, Mass.

First, Because of the danger of such instruction.

Second, Because everything needful or desirable to be imparted to the young may be clearly and adequately taught without ever once drawing near to the line of danger, or demanding the sacrifice of life.

Among men of science, the study of the mental and physical peculiarities of young children has excited, during recent years, no little interest. It has been discovered that if we take the pupils of any large public school and study them carefully as individuals,—physically, mentally and morally,—we shall find in each class a certain proportion below the normal standard. The sight may be imperfect, the hearing may be less acute; there are malformations of body, or confusion of colors; of all these defects, a certain number will be found in every class-room. Test the mental capacity. Every teacher knows that in scores of cases the bright pupil is not over-diligent or the dull scholar blameworthy for his stupidity; that in quickness of perception, ability to grasp and comprehend, tenacity of memory, some scholars will be far above the average; while on the other hand, some will be found abnormally below it, dull of apprehension, quickly forgetful, difficult to arouse, or to interest in any mental work. A step or two below the mental state of some pupil,—and the teacher admits that the border-line of simplicity or semi-idiocy would be nearly reached.

The difference in moral sensibility among the young is found to be equally well marked. No two pupils have precisely the same repugnance to wrong-doing in any direction, or manifest the same sense of honor and love of truth, the same hatred of cruelty, or the same tendency to sympathy. Just as a certain proportion of children are below the average in physical development or mental capacity, so, too, a definite proportion *are imperfectly developed morally;* and in many cases need but slight excitement to have aroused within them impulses to cruelty, vice and

crime. They are "*psychopathics;*" a term which Prof. James of Harvard University employs to denote an inborn aptitude to immoral actions in any direction. This aptitude may not be always awakened; doubtless in many cases, by education and continual normal environment it is gradually outgrown; but if it be once fairly aroused,—so that a sense of gratification is incited by wrong-doing, there are no excesses of cruelty and crime to which these psychopathic children,—these moral imbeciles,—may not go. And curiously enough, it is very often in the direction of cruelty—the infliction of pain—that the first incitement is directed.

Now before a class of pupils in a public school, suppose you illustrate the lesson by dissection of a rabbit or a cat, killed at that time and for that purpose. It is possible that the majority of students might have their attention fixed only upon the facts of anatomy thus illustrated. But to some others,—children quite as likely as otherwise to have been most carefully trained, and to be the objects of most tender solicitude,—there will come slowly creeping into consciousness a vague, abnormal, horrible sense of satisfaction at the sight of this quivering flesh, yet ruddy with the warm blood of out-gone life. Which are the pupils that experience this arousing emotion? Will they confess it to you? Not at all. Yet they may be nearest and dearest to you by every human tie. It is you who have put them to a danger from which they should have been spared. You have aroused within them a sensation that is oftentimes the very mother of every cruelty. For out of this awakened sensation of abnormal pleasure at the sight of blood is born the instinct of murder, and the lowest tendencies of viciousness and crime.

There is yet another aspect of these methods of instruction—their influence upon all children who are entirely normal, but yet exceedingly sensitive to impressions. I do not hesitate to say that nothing such a child will learn by

these lessons can ever compensate for the deleterious impression it may receive by the needless sacrifice of Life in its presence. Say what we will, there is a kind of moral deterioration inseparable from the act of killing anything which is doing us no harm. To put out of existence a noxious animal or insect is to obey the instinct of self-preservation; but to take a perfectly harmless creature, kin to the pet of many a child, and to deprive it of whatever joys come from living—simply that children may see how curiously Nature has constructed it—can hardly fail to give them a sense of wrongful complicity with deprivation of another's rights. Not long since I was talking with a young girl graduate of the principal female college in this country, and although she was greatly interested in the study of biology, she told me that a most distasteful impression was created among the girl-students by the fact that so many rabbits were killed to demonstrate what the sacrifice of a single life would have done equally well. Is it wise to blunt this sensibility regarding the sacredness of life? I am not referring to the psychopathic child, but to all children alike. There will come a time when, as young men and women, they should know how to prevent pain, by causing the painless termination of life; but for childhood, that lesson should be unlearned, and as far as possible delayed. The beauty, the grace, the excellence of all harmless living things is the lesson for children, rather than precocious intimacy with the mystery of Death.

Then too, there is yet another danger. The desire, the ambition to imitate is one of the first instincts of conscious life. I question whether there was ever experiment in classroom that some child or children did not try to imitate it in private or by themselves. Suppose it is merely a dissection of a rabbit just killed. Some child or children will wish to repeat it—and kill the rabbit themselves. Then you have initiated childhood into private vivisection. Is that advis-

able? Admit that the class is cautioned against such repetitions. But you cannot easily convince an inquiring mind that what it is right for the teacher to do in public may not also be copied in the privacy of his own room, and in the presence of his classmates.

But is not dissection of recently killed animals absolutely necessary to a right understanding of the text-book? Not at all. Such methods of instruction are not only dangerous, but wholly unnecessary.

What is the purpose of lessons in school-physiology? Is it to start boys and girls on the road to a medical school? Certainly not. The one great object—in fact the only practical object—is simply to enforce on the minds of the pupils the lessons of Hygiene. What are the plain rules for the preservation of health? What are the effects which may arise from use of tobacco, especially by the young? Wherein lies the danger of alcoholic stimulants? What injury to health comes from over-eating, from improper food, from bad ventilation, from construction of the body by unhygienic dress? How do people ignorantly injure their digestion, their breathing capacity, the heart, the brain? How may typhoid fever be prevented? How does a community help to stamp out scarlet fever, diphtheria, measles, small-pox, and other epidemic diseases? What shall one do in case of an accident, till the doctor comes? These are the lessons of practical hygiene which school children should be thoroughly taught. They are the lessons which instruction in physiology in schools was designed to impart, and the importance of which cannot be over-estimated. But surely it needs no killing of rabbits, cats or dogs, to make such lessons plain. Everything needful may be illustrated by colored charts and manikins. A quickly forgotten smattering of anatomy may indeed be learned by a child, dabbling its fingers in bloody tissues, but nothing which might not be better learned by other methods, without the

danger of moral perversion, and at the cost of not a single pang.

Dangerous and unnecessary. These are the words which, in the august name of Science herself, may we not stamp upon all methods of instruction in our public schools which make for the brutalization of childhood by inducing early familiarity with the sacrifice of Life?

*A DANGEROUS IDEAL.**

It seems almost incredible that at the middle of this Nineteenth Century, there was no law in America which made the cruel treatment of animals, in itself, a punishable offense. Those of us old enough to remember village life, say forty years ago, will recall many an act of inhumanity which then passed for "sport," but which to-day is crime. If a man saw fit to pour alcohol over his dog and set him afire, there was, indeed, protest against his brutality, but otherwise he was safe. The law of the land set no limits to his treatment of his own property. If he chose to burn it alive when its services were no longer of value, who had the right to object?

Certainly to some extent we have changed all this. Cruelty, the needless infliction of pain, the torture for amusement, is at least recognized, not only as an offense against good manners, but as a crime against the commonwealth. Humane societies and Bands of Mercy now inculcate lessons of kindness at the earliest age. Children are to-day taught that cruelty is wicked; that there is something of sacredness in every life, and that mercy is due even to the worm that crawls at our feet.

But is there to be seen any tendency backward at the present time? The infliction of torture upon helpless animals,—is this again coming into general practice, defended by argument, and even taught to young men and young women as a necessity of modern education? This seems to me one of the serious questions of the hour. Within the past thirty years a new ideal has become promi-

* Published by the American Humanitarian League in 1894.

nent; the longing to penetrate to the inmost heart of things, to solve every enigma of Nature, and to unravel each mystery of human existence. Whence comes the origin of life? Whither are we going? What is the cause of all these curious phenomena which we sum up in the word Vitality? These are questions modern science proposes, and desires either to answer or prove unanswerable. Man once sought to know his duty to his God and his fellow-men; the advanced scientific spirit of to-day sometimes asks us if, after all, we are quite certain we have any duties, or if we are sure that God exists?

What is the ideal of this phase of thought? It seems to me, this: *that the chief aim of human endeavor is to wrest from Nature her secrets.*

But supposing certain facts are so intimately wrapped up with life and sensation that we can get at them only by the infliction of acute agony or prolonged pain? What if one who seeks to penetrate to the innermost sanctuary of life must unlearn every lesson of pity, must teach himself to take pleasure in the agony he inflicts, must become almost a human fiend? No matter. What is the sentiment of compassion that for a moment it should stand in the way of scientific investigation? A true physiologist, says Dr. Claude Bernard, "does not hear the animal's cries of pain. He is blind to the blood that flows. *He sees nothing but his idea,* and organisms which conceal from him *the secret he is resolved to discover.*" The question of benefit to one's fellow-creatures need not for a moment enter his thoughts. "I do not believe," says Dr. Charles Richet, Professor of Physiology in Paris, "that a single experimenter says to himself, when he gives curare to a rabbit or cuts the spinal cord of a dog, 'Here is an experiment which will relieve or cure disease.' No; he does not think of that. He says to himself, 'I shall clear up an obscure point; I will seek out *a new fact.*' And this scientific

curiosity which alone animates him, is explained by the idea he has of science. This is why we pass our days surrounded by groaning creatures, in the midst of blood and suffering, and bending over palpitating entrails."*

How far has this spirit of inquiry—no matter at what cost—penetrated American institutions of learning? Does it govern the teaching of our schools of medicine? In schools, academies and colleges, shall young men and young women, boys and girls, be taught that the new scientific Ideal of investigation for its own sake, *demands a personal confirmation of every physiological statement?* Are text-books to give way before the young student with his cords and knife? That is a present tendency, it must be confessed.

In the POPULAR SCIENCE MONTHLY, Dr. Wesley Mills, Professor of Physiology in McGill University, has argued strongly in favor of teaching science by means of experiment. "Introduce scientific methods and introduce science itself according to the laws that underlie our organization and you will revolutionize our schools," he tells the teachers to whom he was speaking. "Physiology is perhaps the most difficult of all sciences to teach well in schools. Book physiology is rubbish, utter rubbish," he exclaims with warmth. "There is no science that does not permit of simple experiments that may be introduced into any school. *The pupils will delight in these,* and they will prove a source of strength, pleasure and inspiration. I am not to be understood as claiming that every fact that a child shall take cognizance of shall be gained through observation and experiment; *but this is the ideal, and the nearer it is approached the better.*" . . . "From first to last the student should be an investigator. This implies a great deal." It does indeed. Not long since I was given the name of a young girl whose scientific enthusiasm had been

* "Revue des Deux Mondes," Feb. 15th, 1883.

so keenly stirred that she gave up her pet kitten to the teacher of physiology that it might be vivisected before her class.

What is to be the outcome of this new and dangerous ideal? I do not see how it can result in anything else than education in the art of scientific cruelty. By instinct nearly every lad born into this world is a savage; it is by training and education that he learns compassion and feels pity. Now suppose the young student is taught that to inflict pain—"to seek out a new fact," as Richet phrases it—is not merely excusable, but deserving of praise? Torture then finds an apology; the inarticulate agony of his pet dog or rabbit will no longer shock. Like Cyon of St. Petersburg, he will approach his vivisections with a "joyful excitement," perhaps all the more pleasureable because aroused by the agony he inflicts. Like Mantegazza of Italy, he may crucify pregnant rabbits with "atrocious torture" (*dolores atrocissimi*), conducting his experiments as the Italian physiologist conducted his, "with much pleasure and patience." Like Klein of London, he will learn to have "no regard at all" for the suffering he inflicts, because, in the progress of his investigations in torture, he "has no time, so to speak, for thinking what the animal may feel or suffer."

Now, speaking as a physician, I cannot but regard this development of the new scientific spirit in our public schools and academies, with grave doubt and apprehension. There are peculiar dangers which invariably accompany investigations like these. For nothing is more certain than that there may arise in some organizations, a strange satisfaction or sensation of content at the sight of agony or bloodshed, and in these cases a great danger, which cannot be fully explained, is close at hand. "I would shrink with horror," said Dr. Haughton, "from accustoming classes of young men to the sight of animals under vivisection. . .

Science would gain nothing, and the world would have *let loose upon it a set of young devils.*" "Watch the students at a vivisection," suggested the late Dr. Henry J. Bigelow, Professor of Surgery at Harvard University Medical School. "It is the blood and suffering—not the science—that rivets their breathless attention." The State of Massachusetts once produced a boy murderer who took diabolic delight in cutting and stabbing children to death. In August, 1891, John Conway was hung at Liverpool for the inexplicable murder of a little boy. Immediately after the drop fell his confession was read: "I was impelled to that crime by a murderous mania—a morbid curiosity to observe the process of dying!"

A Canadian physician was executed in London in 1892 for murder. A number of young women, against whom he had no cause for malice, he had undoubtedly put to death by one of the most agonizing of poisons, and under guise of conferring a benefit, merely that in the contemplation of their suffering he might find pleasure and excitement. Cicero tells us that in his time, men took their sons to gladiatorial combats in order that youth might learn how to die bravely, when the summons came. Ah, if that had been the only lesson taught! A century of such lessons passes; and then this sight of fierce combat and bloody struggle has stirred into life among the Roman populace a taste for human agony that the mere death of gladiators could not satisfy; and then came the infamous exhibitions related by Tacitus and Suetonius, when lions feasted in the amphitheatre upon Christian martyrs, and living human torches, smeared with pitch, burned at night in the gardens of Nero. Over how much of her history, humanity is obliged to draw the veil! Dr. Rolleston, Professor of Anatomy at Oxford University, but hinted at the truth when he told the Royal Commission that "*the sight of a living, bleeding and quivering organism most undoubtedly acts in a particular way on*

the nature within us"—"that lower nature which we possess, in common with the Carnivora!"

I have written this as a warning of which there seems to me a growing need. To the practice of vivisection in medical schools I do not now refer; that is a question by itself. But let me advise parents and teachers to be infinitely cautious before—even in the name of Science—they incur the needless risk of awakening the demon of cruelty in the hearts of the young. No experimentation upon living animals which involves the causation of pain, or the flow of blood, should ever be shown to classes of students in schools. There are no compensating advantages to the positive dangers which the practice involves. There are no scientific truths necessary to be known, which may not be fixed upon the memory of any pupil without this risk.

*STATE SUPERVISION OF VIVISECTION.**

MR. CHAIRMAN AND GENTLEMEN: If I had been asked to speak to-day in behalf of a measure that should abolish vivisection in the District of Columbia, I should have refused without a moment's hesitation. It is the misfortune of our language that a single word must include every phase and form of investigation into the phenomena of what we call life; that we must use it for experiments that are absolutely painless, and for others involving torments as acute and prolonged as the imagination can conceive; for experiments of great utility as well as for those which have not the slightest conceivable relation to the treatment of disease or to any practical end. It has always seemed to me that careful distinctions were never more necessary than in according approval or condemnation to a practice of such infinite variety, and that in view of the great problems which environ the science of medicine, some vivisection must continue. For many reasons, I am glad to support the measure now under your consideration. It does not impede in any way the proper use of animal experimentation. It is not an attack upon the medical profession, to which I have the honor to belong. Its one aim is to bring the practice out of the obscurity in which it is concealed to-day, to place it in the hands of proper individuals, and to put it under legal regulation and the supervision of the State.

Let us look somewhat closely at this bill. Is it either a true or fair statement to assert that this measure is in

* Speech before Senate Committee at Washington, D. C., April 17, 1896, in favor of Bill providing for Government supervision of Vivisection in District of Columbia. From Senate Report, No. 1049.

opposition to scientific investigations? Why, sir, we are dealing with written words that are as plain as any in the English language. In the first place, this bill permits any experiment whatever upon certain classes of living animals when such experiment can be begun and completed without the causation of pain. This is a very broad permission, Mr. Chairman. It is asserted by physiologists that the vast majority of experiments for teaching purposes may be made wholly without pain, by the use of anæsthetics; and if this statement is accurate, we have a large class of vivisections, perhaps a majority of vivisections, which this bill does not prohibit, and seeks only to keep in proper hands. In the second place, this measure does not prohibit inoculation experiments and what are known as bacteriological investigations, even where this class of experiments involve the causation of a certain degree of pain. Think for a moment what this means. All those varied investigations of science which have resulted in the discovery of the antitoxins, all experiments concerning diphtheria, tetanus, consumption, and other germ diseases, are, so far as I can perceive, unaffected by the provisions of this bill. Thirdly, we come to experiments upon living animals, where certain surgical operations are made in order that their utility or uselessness may be first demonstrated before trying them upon man. Such experiments as these may be made under anæsthetics, but the pain of healing must often be severe, as severe certainly as a man would suffer under like circumstances; and yet it is permitted by this bill. Fourthly, we have here no hindrance to whatever tests of drugs or medicines, physicians or chemists may desire to make. I confess, sir, that to me this bill seems to go to the farthest extreme of concession in the anxiety of its framers to yield to the wishes of scientific men so far as may be consistent with the principle of legal supervision. Why, it concedes everything of utility! It asks only that the Law shall be

above the individual; that abuse and wanton cruelty shall be impossible except as a crime; that the methods and results of all experiments shall be officially made known, and that the privileges of experimentation shall be given only to trained and qualified men.

We are told, Mr. Chairman, that there is no necessity for such a measure as this. That depends upon whether vivisection is capable of abuse. I confess that from those who oppose legislation of any kind, I have never heard one word in condemnation of the awful atrocities that have stained the practice of vivisection. But it seems to be a law of nature, that wherever you find unlimited power, you find in due time that power abused; and no facts of History are more capable of verification than the unspeakable cruelties practiced in vivisection by eminent men, in countries where the practice is not controlled by law. Why, both in Europe and America, I have personally seen torment, exquisite and prolonged, inflicted upon living animals, not for any purpose of beneficent discovery, but solely to demonstrate, over and over, facts as well known as the alphabet. Not long since, one of the leading professors in a New York medical college told me of most sickening experiments performed by one of his associates in the laboratory to which he belonged. Yet nothing could be done—the law does not penetrate there. We are becoming a byword, even among physiologists, for our indifference. Dr. Gerald Yeo, the professor of physiology in King's College, London, in an article of the *Fortnightly Review,* protested against English physiologists being held responsible for the cruelties of other lands. "Why repeat," he says, "the oft-told tale of horrors contained in the works of Claude Bernard, Paul Bert, Brown-Sequard, and Richet in France, of Goltz in Germany, Mantegazza in Italy, and Flint in America?"—coupling thus the name of an American physiologist with the names of some of the most inhuman and brutal vivi-

sectors that ever walked the earth. Some five years ago, in this city of Washington, Prof. Theophilus Parvin, M.D., of Jefferson Medical College, Philadelphia, delivered the presidential address before the American Academy of Medicine; and, calling attention to the subject of vivisection, he asserted that there were investigators "who seem, seeking useless knowledge, to be blind to the writhing agony, and deaf to the cry of pain of their victims, and *who have been guilty of the most damnable cruelties, without the denunciation of the public and of the profession that their wickedness deserves and demands.* These criminals are not confined to Germany or France, to England or Italy, but may be found in our own country." "Criminals" and "damnable cruelties" are strong words, Mr. Chairman, to be used by the president of the Academy of Medicine in regard to American physicians or the practice of vivisection in American laboratories!

Take another expression of opinion. In his recent work on "The Meaning and Method of Life," Dr. George M. Gould, late editor of *The Medical News,** and a strong advocate of vivisection, declares nevertheless that it "must be regulated by law." . . . "The practice carried on by conceited jackanapes to prove over and over again already ascertained results, to minister to egotism, for didactic purposes—these are not necessary, and must be forbidden." Well, that is what we are asking by this bill, that qualified men, and not "conceited jackanapes," shall have the right to vivisect. Sometimes it is asserted that no "unnecessary" pain is ever inflicted. Talking on this subject with an amateur physiologist, he told me that on one occasion he was in a laboratory when the professor desired a bit of animal intestine to use in one of his experiments. It would have been easy to have had an assistant kill a rabbit by knocking it first on the head, but that would have

*At present the editor of THE PHILADELPHIA MEDICAL JOURNAL.

occupied half a minute's time. "Give me a rabbit," he called to the assistant, and, taking in his grasp the struggling creature, he plunged the blade of a pair of scissors in the abdomen, cut it open as one would cut a piece of cloth, thrust in his hand, tore out the entrails, cut off what he wanted, and flung the writhing and mutilated creature under the table to die in agony. That is what comes from unrestricted vivisection; and that cruelty is possible in any laboratory in Washington to-day, so far as any law is concerned that alone could make it a crime. When Dr. Klein, of London, was asked by the Royal Commission in regard to his use of anæsthetics, he admitted that he used them only for personal convenience, that he had "no regard at all" for the suffering of the animals, "no time, so to speak, for thinking what the animal might feel or suffer." There is no ingenuity of torment, no method of agony that has not been employed wherever vivisection is wholly unrestricted by law or public sentiment—not for the benign purpose of discovering some new means of ameliorating human misery, but to gratify an atrocious lust, an inhuman curiosity.

And now let us consider the objections to this bill. It is said that no cruelty has been proven in the District of Columbia; that here there are no abuses. Why, the absence of any legal restrictions in regard to this practice is of itself a grave abuse. To close the doors of laboratories where vivisection is going on, and then to demand proof of any abuse of vivisection there, is a method of argument which I do not care to characterize. "But this is an attack on the medical profession." Nonsense. With equal good reason the great insurance companies or the savings institutions of New York or Massachusetts might complain that their integrity is impugned, because the State government demands at regular intervals a report of their financial administration. But laws requiring the supervision and restriction of vivisection "have stopped medical

progress in Great Britain," says the Surgeon-General; "all recent discoveries have been made on the Continent, where vivisection is without restraint." I should like to hear Dr. Sternberg make that statement before the British Medical Association! It is curious, too, that he does not perceive that this method of argument has a double edge. If the very moderate degree of supervision which obtains in Great Britain has there put an end to medical advance, how about the United States, where there has been absolute freedom of experimentation during the past twenty years? What new discoveries of great recognized value in the cure of disease have come out of American laboratories? Not one. But I do not admit for an instant the implied inferiority of the medical profession in Great Britain. It was my fortune some years since, to spend a year studying in the London hospitals, and a yet longer period on the Continent; and nowhere in Europe are the sick treated with the kindness, the sympathy, and the skill which are shown in England, Ireland, and Scotland; nowhere in Great Britain would be tolerated for an hour, the brutality and indifference toward suffering humanity, manifested in certain hospitals of Germany, France and Austria, where vivisection is absolutely without restraint.

But it has been suggested, Mr. Chairman, that the members of the medical profession and scientific men generally stand as a unit in opposing the principle of this bill. No statement could be further from the truth. Not long ago, I had the honor to be appointed on a committee of medical men whose object was to test public sentiment in this respect. A circular was drawn up embodying various phases of opinion, and sent out to the leading scientists and educators of this country, to certain representative names in Europe, and to every physician in New York and Massachusetts who had been in the practice of his profession over fifteen years. Well, only 18 per cent. of the physi-

cians confessed themselves in favor of absolute non-restraint in this matter of vivisection, and no less than 61 per cent. favored the principle of this bill. Let me quote a portion of what they signed:.

"We believe that the common interests of humanity and science demand that vivisection, like the study of human anatomy in the dissecting room, should be brought under the direct supervision and control of the State. The practice, whether in public or in private, should be restricted by law to certain definite objects and surrounded by every possible safeguard against license and abuse."

Sir, the first signature to that statement of opinion, heading a long list of eminent physicians and medical teachers, is the name of one who stands first among those whom science venerates to-day—the name of Herbert Spencer. In support of that position I read the names of physicians and surgeons of the highest prominence, men who believe in vivisection, but not in its cruelties; men whose genius and skill have been devoted for years to the relief of suffering humanity. Can you believe that if supervision and restriction of vivisection meant injury to that art to which these men have devoted their lives, they would have given approval to that principle of regulation which underlies the measure we ask you to enact into law?

And, finally, Mr. Chairman, we ask for this bill your careful consideration because it is in line with the legislation, which during the last hundred years has made for the advancement of civilization. It is a strange and sad commentary upon the innate selfishness of human nature that not one forward step in the progressive development of humanity has ever been made, without opposition from some whose supposed "interests" were in the way. It is not a century since the governmental inspection of insane asylums and private "madhouses" was first instituted, against the protests of their keepers; and no worse atrocities are

recorded in history than those revealed when those secret cells and dungeons were thrown open to the light of day. The State assumed the supervision of prisons and jails, and swept out of existence the torture of criminals by their keepers under guise of "necessary discipline and restraint." In the great coal mines of Great Britain fifty years ago, women and girls, naked to the waist, and half-grown children pushed and drew, in darkness and danger, far beneath the surface of the earth, their burdens of fuel. The Law made it illegal, and women and children were taken out of the mines. The law penetrated the factories of Great Britain; found children working fourteen hours a day at their looms and weeping at their tasks; and although any interference with the privileges of manufacture was most bitterly resented by such statesmen as Cobden and Bright, yet even against their protests, the Law threw about childhood and womanhood its protecting arm.

Until twenty years ago there was nothing to prevent a shipowner from loading his craft as deep as cupidity might suggest, and sending it to sea, often to disappear forever from the sight of men. To-day that is forbidden, and the commonest sailor knows that his life is safer because the Law has intervened in his behalf. Two years ago, while passing through the stock yards at Chicago, my attention was attracted to a pen of animals so horribly diseased that every moment of permitted life seemed almost a cruelty. "These are animals that the inspector has condemned as food," said the official who accompanied me. "Yet up to ten years ago just such animals as these were butchered without inspection and their flesh sold as food; there was no law to prevent it." It is hardly eighty years since the first bill punishing wanton cruelty upon domestic animals was introduced into the Parliament of Great Britain, and it was greeted with shouts of laughter and jeers of scorn. The whole history of social progress may be read on the

statute books in those laws which condemn cruelty, which limit power, which restrain the strong and protect the weak. Let us add another chapter to that record of advancing civilization which this closing century shall have to its account. Let vivisection go on; but only under wise and careful restrictions, permitted only to competent and trustworthy persons, and subject to the control of Law and the supervision of the State.

DOES VIVISECTION NEED CONCEALMENT.

In the pages of a Southern periodical, *Light,* there recently appeared an article on vivisection from the pen of one of our rising young physiologists, Professor Wesley Mills. In more than one respect it is a remarkable paper. Concisely expressed, carefully phrased, it gives us in few words the author's opinion regarding some of the common forms of needless cruelty in agricultural operations, while at the same time it touches with a light hand the alleged evils of scientific experimentation. One begins perusal of such a paper with an interest enhanced by the knowledge that no one better than a physiologist can know the real facts; that it is an expert in vivisection who has laid down the scalpel to take up the pen.

So far as Dr. Mills confines himself to pointing out the varied cruelties of the agriculturist and stock-breeder, he is on ground where every lover of humanity can agree with him. In the treatment of animals we doom to die for our food, there is undoubtedly room for reformation of manners, not only regarding their preparation for our repasts, but in the methods by which we take their lives. No one can visit a great slaughter-house without being saddened by the needless atrocity that seems now so often inseparable from the function of butchery. That the act of killing animals was of itself a danger, Ovid pointed out nearly two thousand years ago in lines which Dryden has paraphrased:—

> "What more advance can mortals make in sin,
> So near perfection, who with blood begin?
> Deaf to the calf that lies beneath the knife,
> Looks up, and from her butcher begs her life;
> Deaf to the harmless kid, that ere he dies
> All methods to procure thy mercy tries,
> And imitates in vain thy children's cries."

But, while agreeing entirely with the condemnation Professor Mills passes upon certain needless forms of cruelty, I must confess to disappointment in his treatment of vivisection. Here he writes as an expert, as a professional physiologist, as an authority to whom one might naturally turn for information. Does he throw light upon dark places? Not at all. Never was reticence more obvious, or, seemingly, more needless. There may be occasions when it is not fit that the whole truth be spoken; but this, certainly, is not one of them. "There is room," writes Dr. Mills, "for difference of opinion on certain points, as, for example, the extent to which vivisections at all painful are to be revealed for the sake of instruction." Very true; but one looks in vain for any expression of the writer's personal views. How far does the professor think it right to go in repeating before his classes of students experiments involving torture? The late Sir William Fergusson, surgeon to the Queen, told the Royal Commission of a case where "an animal was crucified for several days, and introduced several times in a lecture-room for the class to see how the experiment was going on."*

Does Professor Mills think that a case like this is one where "there is room for difference of opinion"?

As a physician, I have never been able to go to the extreme of denouncing all experimentation upon animals even though from first to last no pain be felt. Between the total abolition of all sacrifice of animal life for scientific purposes demanded by many humanitarians, and that absolute freedom to inflict torture without restraint claimed by some physiologists, there must be a middle ground. But to find it, we need to know the whole truth, the exact truth, without circumlocution. In the peculiar obscurity with which this writer seems to veil his opinion, one finds little to assist toward discovery of the real facts. "The

* Report of Royal Commission, Q. 1057.

societies for Prevention of Cruelty properly attempt to punish the abuses of vivisection. The difficulty is in a number of unskilled persons attempting to determine what does really constitute an abuse." But who can assist these "unskilled persons" to solve that difficulty half so well as one whose profession is to vivisect? In fact, what *is* a physiologist's idea of an abuse of vivisection? It would be of the utmost interest to know. I confess I never saw it defined. Is it division of the fifth nerve, the most acutely sensitive in the whole body, the irritation of which always causes intense pain? Is it "an abuse of vivisection" to freeze rabbits to death before a class of young men and young women, merely to illustrate what every one knew in advance? Is it "an abuse of vivisection" to cut down upon the spinal cord of a dog, to demonstrate its functions for the thousandth time? Is the dissection of animals rendered motionless by curare "an abuse of vivisection?" These are all publicly performed in our country. What is the rule, the line of demarcation which, in this professor's opinion, separates use from "abuse" in the practice of animal experimentation?

Of still another statement in this essay I find difficulty in comprehending the true inwardness. "It is but rarely, nowadays," writes Professor Mills, "that vivisection is performed except under the influence of an anæsthetic." Well, how "rarely?" Revolutions are rare, parricides rarely happen, earthquakes rarely occur. Are we to understand that experiments involving pain are thus "rarely" performed? Why, experiments producing some degree of pain are a matter of daily occurrence in every pathological or biological laboratory. Then, too, what is meant by a "vivisection performed under the influence of an anæsthetic?" That the cutting operation is done while the animal is unconscious? That is one meaning of the words. Or does the professor mean to imply that the animals subjected to

various experiments are seldom conscious of any pain from first to last? This is the crucial point.

Suppose I take a dog and, putting it under the influence of chloroform, cut out its kidneys and close the wound. It recovers consciousness. Now I have "performed the vivisection under anæsthetics," have I not? The animal will live from three to five days,—suffering nothing, Professor Mills? Or suppose, upon another dog thus anæsthetized, I cut down to the spinal cord. Two or three hours after, when it has recovered from the shock of the operation, I bring the animal before my class of students, and, by irritation of this great nerve trunk, I subject the dog to excruciating pain. Somebody objects to it. "Why, I gave this animal chloroform while I cut its flesh! It was *a vivisection under anæsthetics.* It suffered no pain while I made my incisions," I reply. In the opinion of Professor Mills, would not such an answer be an utter perversion of the truth?

I like to believe with Professor Mills that "Science begets a truthful state of mind, a desire to state truth, and that only," and that it is insulting to say that "biologists deliberately deceive the public." Nevertheless, is it not possible that the scientific instinct that tends to veracity is occasionally overborne by the seeming necessity to cover up disagreeable facts? Is the whole truth always told when a physiologist is called upon to describe and defend his experiments? In October, 1892, just after the debate in the Church Congress, there was cabled from London to various newspapers in this country a long interview with Professor Victor Horsley, a young physiologist, who had just achieved notoriety throughout England by insulting a venerable lady who was eminent as an English writer before he was born. The interviewer, Mr. Harold Frederic, the regular correspondent of the New York *Times*, graphically describes a visit to the physiological laboratory of Univer-

sity College, London, where he found Mr. Horsley engaged in vivisecting a cat. "I am delighted," said the physiologist, "to afford the public any opportunity to judge for themselves of the cruelty of our methods. We invite criticism." Nothing could be more hearty than such a welcome; and the intelligent correspondent at once began to satisfy his curiosity. What about the sufferings of animals after the operations made upon them? The genial professor smiled at the inquiry, and invited him to take a look at his menagerie "and judge for yourself." In this menagerie, Mr. Harold Frederic tells us, were to be seen "many cats and monkeys, all fat, cheerful, and jolly, playing one with another after their kind, the cats apparently altogether unconcerned as to their brain loss so recently incurred, *and the monkeys quite unaffected by the removal of a spinal cord!*"

Think of a statement like that put forth regarding animal experimentation! Just as truthfully Mr. Frederic might have described monkeys "quite unaffected by the loss of their heads." And yet this correspondent was a brilliant writer, a more than ordinarily gifted and intelligent man, and one far better qualified than most of us, to detect intentional equivocation and to distinguish truth from falsehood.

The entire two-column interview was filled with similar misstatements of facts. "One last question, Mr. Horsley," exclaimed the satisfied investigator. "Do you ever perform any painful operation on a living animal without the aid of anæsthetics?"

"Never! Neither I nor any of my colleagues!"

Now, what did Professor Horsley intend to imply by this most definite statement? That neither he, nor any of his colleagues ever made an experiment causing pain? Such a statement as this, so deliberately and explicitly made as to be without possibility of equivocation or evasion, would have been a falsehood. Yet that is the meaning which even the editor of the New York *Times* drew from Profes-

sor Horsley's words; for in his paper he headed the interview, in small capitals, "ABSOLUTE PAINLESSNESS OF EXPERIMENTS!" That is the meaning which ninety-nine out of every hundred readers of the interview would unhesitatingly accept; that is the meaning which some one apparently intended to convey. It may be "excellent fooling,"—this cheap deluding of the credulous public; but we may be sure that the true interests of science will never be permanently advanced by masquerading a lie under the guise of a truth.

*DOES SCIENCE NEED SECRECY?**

To what extent can scientific authority be implicitly received as the foundation of belief regarding the subject of Vivisection? It is certain that for the great majority of men and women, all statements concerning it are wholly beyond the possibility of verification by personal experience. Regarding its extent or its methods, its pain or painlessness, its utility to humanity or its liability to abuse, the world bases its judgment, not upon knowledge, but upon faith in the accuracy, the impartiality, the sincerity of the men who, standing within the temple of science, know with certainty the facts. One might suppose that here was the welcome opportunity to demonstrate that science can have nothing to conceal; that her symbol is a torch and not a veil; and that above all professional preference and all partisan zeal stands fidelity to accuracy, and the love of absolute truth.

Nevertheless, it is my purpose in this paper to question the wisdom of too implicit faith; to suggest the expediency of doubt; and to point out why statements which may have the support of eminent authority, should sometimes be received with great caution and careful discrimination.

It is not easy to perceive the slightest reason why everything that concerns a scientific method or purpose should not be plainly and accurately set forth. Generally this is the case. If a new telescope of unusual power is desired by a university, Wealth is not asked to give in order that wealth may be increased by lunar discoveries. When an

* The substance of this article was read before the Annual Meeting of the American Humane Association, Minneapolis, September 26, 1895, and was printed in the *Boston Transcript*, September 28, 1895.

astronomical station is established on the Andes, or an expedition fitted out for the North Pole, we all know that science only will be the gainer—not commerce or art. The one exception to an almost universal rule, the one point where truth is veiled in obscurity for the public eye, is when we come to the vivisection of animals. Everywhere else, science seems mindful of her mission, and asks only that with increasing radiance the light may shine.

Now why should vivisection offer an exception to this ideal? That it seems impossible for the professional vivisector to tell the whole truth about the practice, is evident to every person acquainted with the facts. The London *Lancet,* for example, recently praised a biography by Prof. Mosso, in which that Italian physiologist said—as the *Lancet* thinks—*"wisely"* said: "It is an error to believe that experiments can be performed on an animal which feels." A few weeks ago Professor Mosso sent me a manuscript copy of this same essay, in which the sentence appears in slightly different form: "It is an error to think that one can experiment on animals that have not lost sensation; the disturbance produced by pain in the organism of the animal is so great that it renders useless any observations." Here is the utterance of a man of science, trained in the accuracy of the laboratory, occupying one of the foremost positions in Europe as a physiologist, and his words are stamped with the approval of the leading medical journal of England. How is the average reader to question a statement like this? Nevertheless, it is absolutely untrue. One *can* perform experiments "on an animal which feels"; they have been done by the thousand by Bernard, Magendie, Mantegazza, Brown-Sequard, and others; I have seen scores of these myself. No more unscientific sentence was ever written than this statement that one *cannot* do what is done every day! What the Italian physiologist might truthfully have written was this: "It is an error to believe that physiological

experiments, requiring the aid of delicate instruments, can be performed upon an animal unless the creature is made unconscious, or rendered incapable of muscular effort." If he had then gone on to say to what extent this is done by means of anæsthetics, to what extent by the use of narcotics, and to what extent the poison of *curare* is administered to paralyze the motor nerves, leaving sensibility to pain untouched, we might have had a scientific statement of fact. As it is, we have—what? A falsehood? An untruth due to ignorance? An error due to carelessness? I do not know. Perhaps the physiologist was thinking too intently of his own special lines of inquiry to note the significance of his words; but what shall we say of a scientific journal like the London *Lancet* which could quote the untruth as "*wisely*" said? Is untruth ever "wise" where science is concerned?

There was recently given out by Dr. William Townsend Porter, the assistant professor of physiology in Harvard Medical School at Boston, one of the most astonishing statements concerning vivisection that ever appeared in public print. The accuracy of Dr. Porter's statement was vouched for by five other leading professors in the same institution—Drs. Henry P. Bowditch, W. T. Councilman, W. F. Whitney, C. S. Minot and H. C. Ernst; men whose scientific reputation would impart to their affirmations a very great authority throughout the country. They put forth what they asserted was a "plain statement of the whole truth" concerning experiments on living animals. He, perhaps, is a rash man who ventures to question any assertion supported by names like these. But it is the duty of every lover of scientific truth to point out errors wherever he may find them, no matter how shielded by authority or intrenched by public opinion; and I propose, therefore, to make use of this professional manifesto as an illustration of the fallibility of even the highest scientific expert testi-

mony. I think it can be proven that although this declaration rests on such authority, it is nevertheless permeated with misstatement and error; that certain assertions have been made without due authority, and certain facts of pith and moment most singularly omitted, or most carelessly overlooked. If full reliance cannot be given to assertions made by men like these, where can confidence be placed?

I. In the first place Professor Porter does not well when he denies (as he seems to do) that the practice of experimentation upon living animals has ever led to abuse. "The cruelties practiced by vivisectors are paraded in long lists, with the assurance that they are taken directly from the published writings of the vivisectors themselves." Well, is this assurance untrue? "These long-drawn lists of *atrocities that never existed,*"—can these be the words of a devotee of scientific truth? What does Professor Porter mean by them? What other meaning is possible for the average reader to obtain than that he intended to deny that atrocious experiments were anything but a myth? "Never existed?" Why, both in Europe and America, but especially abroad, I have personally seen most awful cruelty inflicted upon living animals, simply for the purpose of illustrating well-known facts, or theories that had not the faintest conceivable relation to the treatment and cure of disease. No facts of history are capable of more certain verification than the tortures which have marked the vivisections of Magendie and Bernard, of Bert and Mantegazza, and of a host of their imitators. "It is not to be doubted that inhumanity may be found in persons of a very high position as physiologists; we have seen that it was so in Magendie." This is the language of the report on vivisection by a royal commission to which is attached the name of Professor Thomas H. Huxley. Says Dr. Eliotson, in his work on Human Physiology (p. 448), "I cannot refrain from expressing my horror at the amount of torture which

Dr. Brachet inflicted. *I hardly think knowledge is worth having at such a purchase.*" But take American testimony on this point. Dr. Henry J. Bigelow, for many years the professor of surgery in Harvard Medical School, of whom Dr. Oliver Wendell Holmes has said, that he was "one of the first, if not the first, of American surgeons," gave the annual address before the Massachusetts Medical Society a few years ago. Therein he called attention to the "dreadful sufferings of dumb animals, *the cold-blooded cruelties* now more and more practiced under the authority of science! . . . . Watch the students at a vivisection. It is the blood and suffering, not the science, that rivets their breathless attention. . . . It is dreadful to think how many poor animals will be subjected to excruciating agony as one medical college after another becomes penetrated with the idea that vivisection is a part of modern teaching; that to hold way with other institutions they, too, must have their vivisector, their mutilated dogs, their chamber of horrors and torture to advertise as a laboratory." Does anyone imagine that Dr. Bigelow here refers to "atrocities that never existed?"*

The American Academy of Medicine includes within its membership men who are as well informed as any in the

* There is something extremely significant in the date of this address, delivered before the Massachusetts Medical Society. Dr. Henry Pickering Bowditch, for many years the professor of physiology in Harvard Medical School, graduated as physician from this institution in 1868, and went abroad to study physiology on the continent of Europe. There he remained about three years, from 1868 to 1871. Returning to America in 1871, he was appointed assistant professor of physiology in Harvard Medical School, and enabled to introduce into that institution all the newer methods of Continental vivisection, which until then, in this country, were comparatively unknown. Now Dr. Bigelow's address *was delivered May 7, 1871.* It is not difficult to discern that on this occasion, in the above-quoted most significant words, he was protesting,—and protesting in vain,—against the introduction of Continental vivisection in Harvard Medical School.

medical profession. At the sixteenth annual meeting, held in Washington four years ago, Dr. Theophilus Parvin, one of the professors in Jefferson Medical College of Philadelphia, gave the Presidential address. Speaking of physiologists, he says that there are some "who seem, *seeking useless knowledge,* to be blind to the writhing agony and deaf to the cry of pain of their victims, and who have been guilty of the most damnable cruelties without the denunciation by the public that their wickedness deserves and demands; these criminals are not confined to Germany or France, *but may be found in our own country.*" Is this the statement of an "agitator?" President Parvin graduated as a physician some years before Dr. Porter was born, and I fancy that he knows of what he speaks. And that physiological experimenter who, defending the utility of vivisection, forgets or denies the existence of atrocity, may be on dangerous ground. Cases have been known where merciless occupation has induced an atrophy of the sense of pity; and its first symptom is unconsciousness of cruelty, and blindness to abuse.

II. But quite as strange as any assertion in this "plain statement of the whole truth" is the implied suggestion that abuse is impossible because everything is so openly done! "These loud outcries to put an end to the frightful scenes daily enacted within the open doors of the most enlightened institutions of learning,"—surely there is a false impression conveyed by these words which their writer should hasten to correct. *"Within the open doors?"* To whom are the doors of the physiological laboratories open? Why, no feudal castle of the middle ages was ever more rigidly guarded against the entrance of an enemy than physiological laboratories are secured against the admission of unwelcome visitors. To some of the largest laboratories in the United States, no physician even, can gain entrance unless personally known. If the Bishop of Massachusetts

and the editor of any leading newspaper in the city were to apply for admittance at Professor Porter's laboratory during a vivisection, would the doors swing open as to welcome guests? Would they be invited to come again and as often as desired, without previous notification? I commend the experiment. Of course a certain degree of this seclusion is necessary and wise. That which I criticise is the implied denial that any secrecy exists and this reference to "open doors." And if doubt still lingers in the minds of any who read, a conclusive experiment will not be difficult to make. Let him but knock at these "open doors" when vivisection is going on.

III. We are informed, too, by these scientific authorities that by so simple a method as "a scratch on the tail of an etherized mouse" and subsequent treatment, "the priceless discovery was made which has at length banished tetanus from the list of incurable disorders." That is an unscientific statement simply because it is untrue. Tetanus, or lockjaw, was never in "the list of incurable disorders"—if uniform fatality is meant; and it certainly has not been taken out of the list by any "priceless discovery" whatever. Consult Aikin, Wood, Fagge, Gross—consult any medical authority whatever of ten years ago—and you find the recoveries from tetanus averaged at that time from ten to fifty-eight per cent. of those who were attacked. Now, what mighty change has been wrought by the "priceless discovery?" Well, I take up the London *Lancet* of August 10, 1895, and I find an English physician tracing "all procurable published and unpublished cases of tetanus treated by anti-toxine," and they number just thirty-eight, of which twenty-five were recoveries and thirteen were deaths. I take up the New York *Medical Record* for August 24, 1895, and I find a correspondent stating that he "can discover in the recent medical literature but six or seven cases in all where anti-toxine or tetanine has been used successfully, and they

were all by foreigners." To call that a "priceless discovery," which is not in general use to-day, which in four years has made no better record than this, and with which the report of hardly a single cure can be found in American medical annals within the last five years,—is *that* a scientific statement? Is it worthy of the reputation of men who allowed it to go forth to the world backed by the eminence of their names?

IV. "It is asserted," says Professor Porter, "that living animals, without narcotics, helpless under the control of poisons which, it is alleged, destroy the power to move while increasing the power to suffer, are subjected to long, agonizing operations, in the hope of securing some new fact, interesting to the scientific mind, but without practical value." This is one of the most curious and ingenious sentences I have ever read. Its inaccuracy depends on only two words, "without narcotics." No critic of vivisection ever made use of those words in any such statement; and I challenge Professor Porter for a single reference or quotation. *It cannot be given.*

But, if instead of the words "without narcotics," Professor Porter had written "without anæsthetics," then he would have made a precise, accurate and true statement of what undoubtedly has been charged. Could any reader imagine that such a charge was true, and that it might exactly apply to some operations carried on in the laboratories of Harvard Medical School? "Helpless under the control of poisons which destroy the power to move, while increasing the power to suffer," writes the physiologist, in seeming amazement at the mendacity that could coin such a lie! Yet that statement is entirely true. The name of that poison is *curari* or woorara; the orthography is not fixed. "Woorari," says Dr. Ott (who has personally made use of it in the physiological laboratory at Harvard Medical School), "is able to render animals immovable . . . by

a paralysis of the motor nerves, *leaving sensory nerves intact.*" The properties of this singular poison have been carefully investigated by Claude Bernard, whose work on experimental science may be seen at the Boston Public Library. "Le Curare," he says, "detruit le mouvement, en laissant persister la sensibilité" (p. 298); "Curare destroys the power of movement, although sensibility persists." Under the influence of this agent the animals upon which the physiologist may be working are "exactly as if solidly fixed to the table, are in truth chained for hours" (p. 310). Does it know what is going on? "When a mammal is poisoned by curari, its intelligence, sensibility or will-power are not affected, but they lose the power of moving" (p. 296). Do they suffer? Is it true, this statement which Professor Porter tells us is "asserted" (and which, by innuendo, he seems to deny) that animals are helpless under control of poisons which destroy the power to move while increasing the power to suffer?" Well, Claude Bernard was one of the greatest physiologists of this century, and he shall tell us. Death by *curare*, he says, although it seems "si calme, et si exempte de douleur, est au contraire, accompagnée des souffrances, les plus atroces que l'imagination de l'homme puisse concevoir,"—sufferings the most atrocious that the imagination of man can conceive! "In that corpse without movement and with every appearance of death, sensibility and intelligence exist without change. The cadaver that one has before him *hears and comprehends what goes on about him, and feels whatever painful impressions we may inflict*" (p. 291). Is an animal ever "*curarized*" in the Harvard Medical School? Even more than this: did not Prof. Porter himself, report the use of *curare*, in his own physiological experiments, for the very purpose which he now affects to ridicule?*

* The *Journal of Physiology* for September, 1893, contained an article by William Townsend Porter on the "*Results of the Ligation of the*

V. Throughout the entire manifesto the word "narcotics" is constantly used apparently as a synonym for "anæsthetics"; we read for instance of "a rabbit narcotized with chloral," a "narcotized dog," etc., but not once of an "anæsthetized" animal. Let us see exactly what these terms indicate.

In the physiological laboratory five different substances are largely employed for producing certain effects in animals used for experiment. Of curare I have just spoken. Chloroform and ether are known as "anæsthetics"; that is, agents which, pushed sufficiently far, produce a degree of the most absolute insensibility to pain. But the trouble with these anæsthetics in the laboratory is their liability to cause the sudden death of the animal experimented upon; and this is often most annoying and inconvenient. The temptation, therefore, is great to substitute for these anæsthetics certain "narcotics" which create a degree of torpor, though they do not prevent pain. Opium (or morphia) and chloral are the agents thus used. An animal treated with ether may be said to be "narcotized." But is the creature thus narcotized, sensitive to the pain of cutting, for example? Take opium. Claude Bernard, the great French physiologist, asserts that sensibility exists even though the animal be incapable of movement; "il sent la douleur, mais il a, pour ainsi dire, perdu l'dée de la defense;"

Coronary Arteries," the small arteries which supply the heart itself with blood. Of these investigations Prof. Porter says:

"Dogs were used in my experiments. The second, third, fourth and fifth dog of the series of 32 recorded here, were given *a small quantity of morphia. Voluntary movements were prevented by curare.*"

Then follows a description of the method employed. The use of *curare* is admitted, and the reason for its employment. "The time occupied by these awful vivisections," says Dr. Berdoe, "varied from 18 to 100 minutes. In course of the investigation, fifty arteries were prepared for tying." How such experiments were of any utility whatever,—except "to minister to egotism,"—it is not easy to perceive.

he feels the pain, but has lost, so to speak, the idea of defending himself. Do surgeons use morphia to prevent the pain of a surgical operation? Or take chloral. It is a narcotic; it tends to produce sleep. Is it an anæsthetic? Dr. Farquharson of St. Mary's Hospital says in his "Guide to Therapeutics" (p. 195): "Recent observation goes to show that *chloral is in no sense a true anæsthetic.* . . . Chloral having no influence over sensory nerves, has no power, *per se,* of allaying pain." Dr. Wood of Philadelphia seems disposed to think that "in very large doses" chloral will produce insensibility to pain; but he adds that unless the amount employed be so large as to be almost poisonous, "this anæsthesia is in most cases very trifling."

For use in the physiological laboratory, the dose for a rabbit is fifteen grains, or one gramme. What shall we say of most painful experiments upon rabbits, "lightly chloralized" with one-tenth the ordinary dose? *Such investigations were made by Professor Porter himself, at the Harvard Medical School, and within the last two years.*

VI. And this brings me to a point upon which I am loth to touch, since it would seem to involve the most positive contradiction of statements made by scientific men of high repute. Speaking in the plural number for his five associates, Professor Porter has said of vivisections causing pain, that "such investigations are rare. *None such have been made in the Harvard Medical School within our knowledge.*" This assertion has been widely copied, and is almost universally accepted as true. The Boston *Transcript* doubtless echoed the sentiment of the public when it declared in its editorial columns that "the character and standing of the medical men whose names are given as responsible for this explanation to the Boston public *forbid any questioning of its statements of facts.*" What is the value of authority if one may assume to disbelieve in a case like this? Here is the assertion of six scientific teachers. For the general

public, nothing would seem to remain but unquestioning acceptance, and implicit belief.

But a great English thinker has said that doubt is the very foundation of science, since "without doubt, there would be no inquiry, and without inquiry, no knowledge." In the interest of scientific truth, I venture here, to suggest doubt rather than credulity. We have an assertion which is either true or false. I doubt its truth. I affirm that evidence exists that experiments have been made in Harvard Medical School under the following circumstances:

1. Animals have been "*curarized,*" and in that condition vivisected. Curare is not an anæsthetic, but simply prevents the animal from moving, while remaining entirely sensible to pain.

2. Animals have been "very lightly narcotized" and in that condition vivisected. There is no evidence that animals "lightly chloralized" are insensible to pain.

3. In the majority of published accounts of experiments, there is no mention whatever of anæsthetics being used. In a few instances only, there is reference to the administration of ether before the preliminary cutting, often followed later by use of *curare.*

4. The majority of these published investigations, so far as discovered, relate to curious questions in physiology, and have no perceptible relation to the treatment or cure of human ailments.

For proofs of these statements I refer to the published accounts of various experimenters themselves, concerning their own investigations. Most of them may be found in somewhat rare volumes entitled, "Collected Papers, Physiological Laboratory of Harvard Medical School."

1. Dr. Ott on the Action of Lobelina. "The number of my experiments was six, and all were made on rabbits. . . . Into the left jugular had been bound a canula, through which the poison was injected toward the

heart. (Exp. I.) *As the injection of the poison caused struggling. . . . I used curare to paralyze the motor nerves.* (Exp. II.) Rabbit, curarized, vagus irritated. (This experiment lasted thirty minutes.) From another series, we may quote the Exp. VIII. Dog; vagi and sympathetics cut; artificial respiration, etc.

"The above experiments *were made in Professor Bowditch's laboratory at Harvard Medical School.*" There is no mention of anæsthetics.

2. Dr. Ott on the Action of Thebain. "In all cases of poisoning by thebain, the functions of the sensory nerves remain unimpaired till death, as convulsions are always excited by touch, up to that period" (p. 5). "I have made use of the beautiful method of Brown-Sequard in cutting off the action of the poison on the lower segment of the spine," etc. "The experiments on the circulation were twenty-six in number and were made on rabbits. . . . Artificial respiration was kept up. . . . *Curare* was used." Dr. Ott makes no mention of anæsthetics.

"It is well-known," says Dr. Ott, "that the irritation of a sensory nerve causes an excitation of the vaso-motor centre, which is indexed by a rise of pressure. The following experiment was made: Ludwig's gimlet electrodes were screwed into the atlas and occipital bone (the skull of a rabbit) for direct irritation; vagi cut; *curare;* sciatic nerve prepared; vaso-motor centre irritated through a sensory nerve three seconds; directly irritated for eleven seconds." The entire experiment lasted twenty-five minutes; the pressure rose from 150 to 186 and 198. Dr. Ott adds: "As indirect irritation always produces a rise of pressure, *the sensory nerves and the conductors of their impressions are not paralyzed*" (p. 12). Will some one assert that this was a "painless" experiment? Where was it done? "The above experiments *were made in the physiological laboratory of Professor Bowditch at the Harvard Medical School.*"

3. Dr. Walton on the Epiglottis. Case IV. "Dog; epiglottis excised; watched six days; coughed at almost every attempt to eat or drink. Case X. Large dog; epiglottis excised; observed twenty-one days; choked in swallowing liquids and solids at every trial." "The experiments were performed in the laboratory of Harvard Medical School." A dog, strangling in all attempts to swallow food for a period of three weeks can hardly be said to undergo "a painless experiment."

4. Dr. Hooper's Experiments. "The following experiment was made in order to ascertain whether an upward movement of the cricoid cartilage was necessarily associated with increased capacity of the larynx." Small dog; *curarized;* artificial respiration; pharynx plugged; a cord tied around the head and jaw in front of the ears to compress the cotton and the passages leading upward. Trachea divided; a tubulated cork secured in upper end. "It may be questioned certainly how far an experiment of this kind can be applied to the living human larynx, or with what logical justice we can draw conclusions from it." "The experiments recorded in this paper were performed in the physiological laboratory of Harvard Medical School." Of another series of ninety-four experiments upon nine different dogs, it is stated that they were etherized *"during the early part of the operation."* But what of the later stages of these ninety-four experiments upon *"curarized"* animals? Were they painless?

5. Vaso-motor Experiments upon Frogs, by Dr. Ellis. "All the frogs were *curarized.* . . . The sciatic nerve laid bare and cut in the upper part of the thigh." Dr. Ellis tells us that "many frogs were used;" that different frogs vary greatly in their susceptibility to different forms of electrical irritation;" that "each animal is a law unto itself;" that "the individual peculiarities of different frogs and the varying conditions to which they are subjected add perplex-

ing elements to the problem;" that "very delicate apparatus was employed;" that in some instances a "curious result was obtained by striking the abdomen rapidly for a short time, causing the force of the heart-beats to much diminish;" that sometimes the little creature's heart becomes "enormously swollen with blood, as shown by the great rise in the lever;" that shocks were "given once every second" in certain cases, and that "very beautiful records can be taken." All this may be interesting to the physiologist; but what practical results were obtained? "We cannot believe," says the Harvard manifesto, "that such inquiries are ever undertaken without . . . the conviction that the benefit to humanity will far outweigh whatever suffering they may cause to the animals." These are beautiful words! Let Dr. Ellis state the results of his experiments in his own way: "The results of our experiments point to the existence of a vaso-dilator as well as a vaso-constrictor mechanism *in the frog!*" That is all. The "benefit to humanity" was about as much as would come from the discovery of a silver mine in the moon.

6. Dr. Bowditch's Experiments on the Vaso-motor Nerves. "After some preliminary experiments on other animals, it was decided to use cats in this research, since adult cats vary less than dogs in size, and are much more vigorous and tenacious of life than rabbits or other animals usually employed in physiological laboratories. *The latter point is one of considerable importance in experiments extending over several hours.* The animals were *curarized* and kept alive by artificial respiration, while the peripheric end of the divided sciatic nerve was stimulated by induction shocks, varying in intensity and frequency. . . . The experiments were so prolonged that it seemed important to give to the air thrown through the trachial canula into the lungs a temperature as near as possible to air respired through the natural channel. . . . The cat to be

experimented upon was first etherized by being placed in a bell-glass with a sponge saturated with ether, and then secured, the head being held in an ordinary Czermak's rabbit-holder. The sciatic nerve was then divided. In some cases the cat was allowed to recover from the effect of the ether, and the experiment postponed some days; in others, a half-per-cent. solution of *curare* was put into circulation while the animal was still etherized." (The effect of the curare would be to render the animal motionless, after recovery from the ether; it has no other use.) In all, there were 909 observations made upon "about seventy cats."* In one experiment "a tetanic stimulation was applied for fifteen minutes to the sciatic nerve. The result was a constriction steadily maintained during the continuance of the irritation." If there were any results for the "benefit of humanity" in these investigations, they are not recorded. These experiments were made at Harvard Medical School; and I submit that they were by no means "painless."†

* In the *Boston Transcript* of Feb. 10, 1886, the Dean of Harvard Medical School was reported as denying that cats were used for vivisection, and as affirming that although connected with the School since his graduation he had "never seen or heard of a cat being in the building." It is indeed strange that the fame of Dr. Bowditch's researches upon these "seventy cats" did not even reach his associate in the same building!

† In notes to a published address delivered in 1896 before the annual meeting of the Massachusetts Medical Society, Dr. Henry P. Bowditch makes a brief reference to the foregoing experiments. After insisting that the prolonged electrical stimulation "could not by any possibility have been accompanied by any sensation," he adds:

"Even Dr. Leffingwell, a writer who is comparatively reasonable in his opposition to vivisection, in a recently published pamphlet entitled 'Does science need secrecy?' cites these experiments *as evidence of cruelty practiced in the Harvard Medical School.*"

This merely serves to illustrate the theory that the habitual practice of vivisection dulls the sense of accurate perception and the capacity for stating facts. Where are the above experiments of Prof. Bowditch

7. Dr. Bowditch's Experiments on Nerves. These were made upon cats "in the laboratory of Harvard Medical School." "The animals were kept under the influence of a dose of *curare* just strong enough to prevent muscular contractions; while artificial respiration was maintained, and the sciatic nerve constantly subjected to stimulation sufficiently intense to produce in unpoisoned animals, a tetanic contraction of the muscles. In this way it was found that stimulation of a nerve lasting from one and a half to four hours (the muscle being prevented from contracting by curare) did not exhaust the nerve." The foregoing quotation is from an address given before the American Association for Advancement of Science, August, 1886—nine years ago. If any great "benefit to humanity" has resulted from them, it has not yet been made public. Were these experiments "painless?"

cited "as evidence of *cruelty?*" The Harvard professor of physiology, with some of his associates, declared that "painful vivisections" were rare, and "*none such*" had been performed in their laboratories. Was that the truth? This is the question at issue. Professor Bowditch insists that his "stimulation" could not have occasioned any sensation. What of that? To select one part of an experiment and to insist on its painlessness,—ignoring all the rest,—is certainly a very questionable method of defense. To take some seventy animals, chosen especially for vigor and tenacity of life, so that experiments might "extend over several hours;" to administer *curare* so that after recovery from the anæsthesia (under which the initial cutting operation was made), they would be incapable of the slightest movement; to make one cut in the throat, and another across the sciatic nerve; to experiment upon some of them for hours, the head immovably fastened in a rabbit-holder, while others are allowed "to recover from the effect of the ether, and the experiment postponed for some days;"—and then to declare that all these wounds, these severed nerves, these manipulations, these delays for days, this artificial respiration and immovable position occasioned no painful sensations in any of these creatures,—was doubtless more than Prof. Bowditch could bring himself to assert. It was easier to refute an invented charge of "cruelty" than the real charge of inaccuracy and untruth.

8. Dr. Ernst's Researches into Rabies. In the "American Journal of Medical Sciences" for April, 1887, there appears an account of certain investigations into the nature of rabies and hydrophobia, made by Dr. Harold C. Ernst of the Harvard Medical School. Some thirty-two rabbits were inoculated with rabies, and all of them died of this terrible disease. Without touching upon the question of utility in this particular instance, I submit that by his own account of these investigations, they were by no means painless.

9. Experiments of Prof. Porter on the Spinal Cord. In the "Journal of Physiology" for April 6, 1895, appears a long and elaborate article on the "Path of the Respiratory Impulses," by Professor William Townsend Porter, of the Laboratory of Physiology in the Harvard Medical School, the author of the preceding manifesto. Taken in conjunction with his assertion regarding painful vivisections that "none such have been made in Harvard Medical School within our knowledge," this paper would seem to offer a very curious and significant illustration of scientific forgetfulness. The object of Professor Porter's experiments was the confirmation of a purely physiological hypothesis; one which had no reference whatever to the cure or treatment of human ills. His researches embraced at least sixty-eight experiments, and full details of fifteen are given in this essay. In seven of these fifteen experiments—all involving most painful mutilations—light doses of morphia or chloral were administered instead of anæsthetics; in one experiment the dose is not given, and in another there is no mention of any "narcotic" of any kind. Even when ether was given, it was not as a rule used throughout the experiment. Some examples will be of interest; the italics are mine.

"I have separated the cord from the bulb in eight rabbits and six dogs, all fully grown. . . . Artificial respira-

tion was kept up a long time. . . . The animals were all *very lightly narcotized.*"

Exp. I. Dec. 19, 1893. "The fourth ventricle was laid bare in a large, *lightly chloralized* rabbit, and the floor of the left side of the medium line burned away with small hot glass beads. Respiration continued on both sides in spite of repeated cauterizations."

Exp. II. Dec. 15, 1893. "Most of the left side of the floor of the left ventricle of a rabbit, *lightly chloralized* (not over 0.1 g.), was burned away." (*This was one-tenth the usual dose of chloral.*)

Exp. XXIII. Feb. 27, 1894. Dog narcotized with morphia. Cervical cord exposed its entire length; severed at the sixth cervical vertebra, and the posterior roots of the cervical nerves cut. (An exceedingly painful experiment.)

Exp. LXVI. Nov. 20, 1894. Rabbit, "*lightly narcotized* with ether." Left phrenic nerve "was seized near the first rib and torn out of the chest." . . . "I have made such experiments on thirteen rabbits and one dog, and the result has *always been the same.*" A beautiful engraving gives the respiratory curve of this rabbit, "the left phrenic nerve of which had been torn out." . . . "*The stars denote struggling.*"

Exp. LI. May 3, 1894. "At 10.30 a middle-sized dog received 0.2 g. morphia. Half an hour later, the left half of the spinal cord was severed. . . . Animal being loosed, showed a paralysis on the left side. . . . At 4.30 the dog was bound again and the abdomen opened." Why was the dog "bound again?" No mention of "narcotic" or anæsthetic during further steps of the experiment.

Exp. XXV. Mar. 3, 1894. Dog; given 0.15 grammes morphia sulphate; tracheotomized, spinal cord severed at sixth cervical vertebra; artificial respiration.

Exp. XLIX. May 1, 1894. "At 10 A. M. the left side

of the spinal cord of a rabbit, narcotized with ether, was cut. . . . At 4 P. M., 5½ hours after, breathing was bilateral. . . . On opening the abdomen . . . diaphragm was once more exposed and cut in two pieces." . . . (No mention of anæsthetic or narcotic during latter half of experiment, "5½ hours later.")

Exp. LII. May 4, 1894. Spinal cord of rabbit narcotized with ether, cut on left side. . . . Seven hours later he was in good condition and *kicked vigorously as he was again put on the board.* The abdomen opened in the median line . . . phrenic nerve was now cut, etc. There is no mention of narcotic or anæsthetic during the latter part of the operation, "seven hours later" when the rabbit, kicking vigorously, "was again put on the board," to have its abdomen opened.

Exp. LVI. May 14, 1894. Rabbit, etherized and tracheotomized. Spinal cord cut; artificial respiration; "The narcotic was stopped. On turning the rabbit and opening the abdomen," etc. Why was not the abdomen opened before "the narcotic was stopped?"

Exp. LXI. Nov. 8, 1894. The right half of the spinal cord of a full-grown rabbit was severed . . . the phrenic nerve cut . . . artificial respiration, etc. There is no mention whatever of either narcotic or anæsthetic being used in this experiment.

"Other experiments could be added, but they seem unnecessary," says Professor Porter. We agree with him.

There are few laboratories in Europe better equipped for vivisection than the scene of all these experiments. In one of his works, Dr. Ott pays a tribute to the inventive genius of Prof. Henry P. Bowditch of Harvard Medical School, who, it seems, has contrived a new device for holding immovably the head of an animal to be vivisected. "It consists of a fork-shaped iron instrument, the points of the fork united by an iron bar . . . which is passed behind the

canines (teeth) and bound fast by a strong cord which is fastened over the jaws. When the iron rod is fastened to the prongs, the handle is inserted into the screw-sliding points of the upright rod of a Bernard holder," in which device certain straps prevent the dog "from retracting his nose." But how can a dog retract his nose if insensible? Why should he wish to retract his nose if he is suffering nothing? "I sometimes fear," said Dr. Theophilus Parvin in his address before the American Academy of Medicine, "that this anæsthesia is frequently nominal rather than real; else why so many ingenious contrivances for confining the animal during operations, contrivances that are not made use of in surgical operations upon human beings?"

These were Boston vivisections. They were not done thousands of miles away in some distant European laboratory, but here at home. Should they have been left in the secrecy of physiological literature? Then assuredly their existence ought not to have been so explicitly denied by some of the men who performed them.

What judgment are we entitled to pass upon this manifesto? Was it, indeed, what it claimed to be—"a plain statement of the whole truth?"

No. A "statement of the whole truth" would not have carefully mentioned "a scratch of the tail of an etherized mouse," and made no reference to other investigations of infinitely greater import carried on in their own laboratory. A statement of the whole truth would not have spoken of "long-drawn lists of atrocities that never existed"—denying in one sweeping sentence some facts as certain as any in history. A statement of the whole truth would not have referred to "narcotics" as though they were identical with "anæsthetics"; it would not have left hidden the use and purpose of curare; it would not have referred to "open doors," when there are no open doors; it would not have proclaimed to the public as a "priceless discovery" for the

cure of tetanus, an agent of which not five cases of successful employment in this country can be found in medical literature. And above all, a plain statement of the whole truth would never have declared that no painful vivisection had been made in Harvard Medical School "within *our* knowledge," in the face of the evidence I have given in this paper.

I am not an anti-vivisectionist, for I believe in the practice, when it is rigidly guarded against all abuses, limited to useful ends, and subject to public criticism and the supervision of the law. But I cannot believe that science ever advances by equivocation, or gains by secrecy. If, in the opinion of scientific experts, certain phases of vivisection must be kept from the world's judgment and criticism by evasion and suppression of truth, then I fear the time may come when society will question the expediency of all such methods, from higher considerations than those that affect man's relations to the animal world. For science could continue even if vivisection were to cease, but without veracity and good faith, Society itself cannot exist.

*SOME MISTAKES OF SCIENTISTS.**

It is a view widely entertained, that a scientist is no ordinary individual; he is a man set apart, as it were, in a peculiar priesthood, for the discovery and promulgation of scientific truth. To unveil for himself the great mysteries of Nature, and then to make his discoveries known,—these are the great objects to which he is thought to have devoted his life. Certain virtues are regarded as peculiarly his own, and as intrinsically connected with scientific pursuits. Other men may blunder into false affirmations through ignorant over-confidence; the man of science is supposed to be slow to make any statement, unless he is sure of his facts. Other men err through carelessness; he is trained in the laboratory where precision is considered as the first of the virtues, and inaccuracy is counted as a disgrace. Other men may be indifferent to veracity where commercial interests are at stake, or when private gain hints at the utility of deceit; but falsehood, fraud, and equivocation are supposed to be foreign to every fibre of the nature of one devoted to scientific work. It is no slight advantage thus to enjoy the abounding confidence of the intellectual world. If almost universal faith is to-day accorded to the statements of a man of science, it is not merely because of trust in personal integrity and in honesty of purpose, but also because of belief that even from errors arising from ignorance or carelessness his assertions are peculiarly free.

So much for the popular conception of the influence of science-study upon the virtue of accuracy. Is this ideal based upon the truth? It is more than doubtful. There is abundant evidence that some of the most eminent men of

*From Senate Document 78, Fifty-fifth Congress. Revised.

science in America have made statements pertaining to matters with which they are supposed to be familiar, statements which have been proven to be wholly untrue. To suggest the causes that may have led to such erroneous assertions is not the purpose of the moment; rather it is designed from time to time, in the interest of Science herself, to point out the existence of wide-spread inaccuracy, and to suggest, as a just conclusion, that until it is explained, popular confidence in the bare assertions of certain scientific men is confidence misplaced. We need not imply that the untruths uttered were deliberately made. In their influence upon public opinion, blunders arising from ignorance or failing memory are no less harmful than when due to deliberate mendacity. The judgment appealed to is swerved simply by the false statements, and the evil done is not atoned for even by the honest intention—when such intention exists.

As examples pertinent to the present hour, let us look at certain statements made by the Surgeon-General of the United States Army, Dr. George M. Sternberg, and by Dr. S. C. Busey, the President of the Medical Society of the District of Columbia, while they were opposing the bill before Congress which provided for the regulation and government supervision of the practice of vivisection.

No man has taken a more active part in opposing the bill brought forward in Congress for some slight supervision of animal experimentation than the Surgeon-General. Before the Commissioners of the District of Columbia and before a Committee of the United States Senate, he appeared to throw the weight of his influence against the measure proposed. To few men in America is it probable that more deference would be paid, when speaking officially as an expert in regard to vivisection. Was Gen. Sternberg worthy of this confidence? Protesting against any supervision of that practice to which he has devoted so many years of his life, did he make statements which are scientifically untrue?

Before now, his accuracy has been impeached. I propose to question it again, and supplying evidence upon which doubt is based, to give an additional reason for disbelief in his reliability as a witness upon matters pertaining to the vivisection of animals and the pain thereby produced.

On the 17th of April, 1896, the Senate committee gave a hearing to arguments for and against a bill, the object of which was to place the practice of vivisection in the District of Columbia under the supervision and control of the Government of the United States. In his address before this committee, Mr. Ross Perry, of Washington, alluded briefly to certain revolting and cruel experiments made by an American, Dr. B. A. Watson, which consisted in dropping no less than 141 dogs from a height of 25 feet in such a way as to produce the greatest amount of injury to the spine, consistent with the temporary preservation of life. In regard to these American vivisections there have been vigorous expressions of condemnation, even by those who are among the strongest advocates of experimentation upon animals. In an address delivered before the American Academy of Medicine at Atlanta, Ga., May 2, 1896, Dr. George M. Gould, the present editor of the PHILADELPHIA MEDICAL JOURNAL, speaking upon Vivisection, said:

"At present the greatest harm is done true science by men who conduct experiments without preliminary knowledge to choose, without judgment to carry out, without true scientific training or method—and only in the interest of vanity. It takes a deal of true science and patience to neutralize with good and to wash out of the memory the sickening, goading sense of shame that follows the knowledge that in the name of Science, a man could, from a height of 25 feet, drop 125 dogs, . . . and for days observe the result, until slow death ended the animals' misery. While we have such things to answer for, our withers are surely not unwrung, and in the interest of Science,—if not from other motives,—we have a right to decide who shall be privileged to do them."

Referring also to the author's account of these same experiments, the BRITISH MEDICAL JOURNAL, the highest medical authority in England, in its issue of November 15, 1891, said:

"The present pamphlet calls for our strongest reprobation as a record of *the most wanton and stupidest cruelty we have ever seen chronicled under the guise of scientific experiments.* . . . Apart from the utterly useless nature of the observations, so far as regards human pathology, there is a callous indifference shown in the description of the sufferings of the poor brutes which is positively revolting. . . . He was not satisfied with a few of these cruel mockeries of scientific research, but indulged in one hundred and forty-one. . . . We can hardly wonder that the author was exposed to considerable annoyances at one time. We think he would have been exposed to more in most countries. What conclusions can be drawn from these unscientific experiments, that dogs falling from a height of 24 feet were liable to rupture or injure lungs, liver, kidneys, viscera, blood vessels, or bones? Is there anything new or useful in this grand discovery? . . . We trust no one in the profession, or out of it, will be tempted by the fancy that these or such-like experiments are scientific or justifiable. Badly planned and without a chance of teaching us anything, and carried out in a wholesale, cruel way, we can not but feel ashamed of the work as undertaken by a member of our profession."

It is difficult to imagine how a medical journal could use stronger language in regard to a scientific experiment than is here given. It embraces distinct charges of stupid, wholesale, revolting cruelty. To Mr. Perry's characterization of these experiments, Surgeon-General Sternberg felt called to reply, if only to break the impression the Senate committee had evidently received. Referring to these investigations, and to other similar experiments on the spinal cord mentioned by Mr. Perry, the Surgeon-General said:

"I would say that I have not seen the papers; but, in the first place, I do not believe that any surgeon or experimenter would think of making such an experiment without the use of anæsthetics. In the second place, *the spinal cord is not sensitive.* This idea that

pain increases from the extremities of the nerves up to the brain is a fallacy.

Senator BACON. Have you demonstrated that by experiments upon yourself?

Dr. STERNBERG. *We have plenty of evidence.* I do not think it necessary to make an experiment upon myself. I have run my probe into a brain to see if it could be felt. *There is no sensitiveness of the spinal cord.*

Senator GALLINGER. To what extent would you carry that? Do you mean to say that an injury to the spinal cord would not produce pain?

Dr. STERNBERG. If you had pressure upon the spinal cord it would produce paralysis and prevent the feeling of pain.

Senator GALLINGER. But unless that paralytic condition were produced there would be pain, would there not?

Dr. STERNBERG. *I think not."**

To nullify the charge of "stupid and wanton cruelty" General Sternberg in the first place suggests a doubt whether such experiments would be made by any surgeon or experimenter "without the use of anæsthetics." Dr. Watson's pamphlet describing these vivisections is to be seen in the library of the Surgeon-General, and it contains no intimation or suggestion of their employment.

In the second place, General Sternberg implies that these experiments could not have been so very cruel or revolting, because—as he distinctly tells the Senate committee—"the spinal cord is not sensitive." If Surgeon-General Sternberg had said that certain parts of the spinal cord appear to be insensible to irritation which generally produces pain, he would have been scientifically correct. That, however, would not have answered the purpose of the denial; and making no distinctions or explanations, he boldly informs the Senate of the United States, not only as an expert in vivisection, but also as the highest official authority on surgery in the country, that *"there is no sensitiveness of the spinal cord; . . . the spinal cord is not sensitive."*

*Report 1049. Fifty-fourth Congress, p. 50. Italics ours.

Was Surgeon-General Sternberg a trustworthy and reliable witness in his evidence on this point before the Senate committee? In regard to the sensibility or sensitiveness of the spinal cord, let us look at the testimony given by other experts in vivisection when they had no private interests to defend, and no object but the truth.

Dr. John C. Dalton, for many years the professor of physiology in the College of Physicians and Surgeons, New York, and at one time probably the preceptor of Dr. Sternberg himself, states in his text-book on physiology:

"Whatever minor points may remain in doubt, the principal fact is unquestioned that *the posterior parts of the spinal cord are sensitive to irritation.*

Both posterior and lateral columns near the entrance of the posterior nerve roots *are endowed with sensibility.*

The irritation of these columns by artificial stimulus, *according to all observers, produces signs of sensibility.*"

Dr. Brown-Sequard, of whom his brother vivisector, Dr. Carpenter, has said that "he probably inflicted more animal suffering than any man of his time," has described the agony which he produced after cutting the posterior columns of the spinal cord. In the London Lancet of July 10, 1858, he says:

"Before the operation in rabbits, the most energetic pricking produces agitation, but no shrieking; after the operation the least pricking produces shrieking and a much greater agitation. Sometimes the excessive sensibility is so great that the least pressure on the skin *makes the animal shriek. . . . It has been so in all the animals I have operated upon,* and I have already made this experiment upon animals *belonging to more than twenty species.*"

One of the first men in America to illustrate lectures in physiology by the practice of class-vivisections was Dr. Austin Flint, for many years the professor of physiology in Bellevue Hospital Medical College of New York. In his

text-book on Human Physiology, he tells us that "the positive results obtained by Longet, Fick, Vulpian and others who regard parts of the cord as excitable and sensible, show that parts of it react under direct irritation." Dr. Flint instances some of his own experiments on this point, "made upon a living dog."

"The cord having been exposed in the lumbar region and stimulated mechanically and with an electric current, two hours after the operation *certain positive results were obtained,* which led to the following conclusions. . . .

The gray substance is probably inexcitable and insensible. . . . *The surface at least of the posterior columns is very sensitive especially near the posterior roots of the nerves."**

Here is evidence directly derived from vivisection, and stated by one of the most experienced of American vivisectors.

Another experimenter, Dr. A. Chauveau of France, has described a series of vivisections which he had made for the express purpose of determining "the excitability of the spinal cord, *and especially the convulsions and pain produced by working upon that excitability.*"† The study was made almost exclusively upon the larger domestic animals (horses, asses, etc.) because "they lend themselves marvelously to the localization of excitation by the great volume of their spinal marrow. . . . I *consecrated* especially to this study more than eighty subjects"—enough certainly to prove his facts. After being immovably fastened, an incision about a foot long was made over the spinal column of the creature, "the vertebræ are opened with the help of a chisel, mallet, and pincers, and the spinal cord is exposed." No mention is made of any "anæsthetic," and, indeed, its use would be impossible in any study of sensibility. Let us

*Flint, "Text-book of Human Physiology," Fourth Edition, p. 595.
†Journal de la Physiologie, Vol. IV.

quote some of these experiments upon the spinal cord which Surgeon-General Sternberg told the Senate committee was "not sensitive:"

Exp. I. "Very large horse, aged 12 years, vigorous, but suffering from incurable disease in the foot. . . . The cord is exposed by removing the arches of the first and second lumbar vertebrae. *The operation takes a long time.* . . . We pass to the excitation of the left spinal cord. *The animal gives very lively signs of excitability.*"

Exp. VII. "A vigorous mule. . . . When the cord is pricked near the line of emergence of the sensitive nerves, *the animal exhibits the most violent pain. He groans and makes furious motions which are prolonged for a long time.*"

Exp. VIII. An ass. . . "When we reach the external edge of the posterior cord, the scratching of the spinal cord provokes immediately *signs of the most violent sufferings.*"

Exp. X. "A small ass very thin; pricked on the line of emergence,—*intense pain.*"

Exp. XI. Vigorous horse. (Pricking the cord as before.) "The animal exhibits *most evident signs of pain. He groans, and abandons himself to disorderly movements.*"

Exp. XII. Old horse. (Same irritation.) *"Signs of violent pain."*

Exp. XIII. A goat. Spinal cord pricked at the usual place. *"Violent immediate pain exhibiting itself by piercing cries."*

Exp. XX. An old white horse "lying on the litter, unable to rise, but *yet very sensitive.* . . . At whatever point I scratch the posterior cord, *I provoke signs of the most violent suffering.* . . . The animal agitates himself most violently."

Exp. XXV. An old mare, "very docile." "The electric excitors had hardly reached the edge of the posterior cord, when the animal made the most disordered movements, *uttered cries of pain, and manifested the violent suffering it experienced.* To produce these effects, it was only necessary to make an almost imperceptible movement of the instrument. Nothing is more curious. . . . I *provoked the manifestation over and over again.*"

Exp. XXVI. "An old horse, thin and feeble." In addition to the usual phenomena, other manifestations of extreme agony were evoked: "The tongue is in constant movement, the globes of the eyes roll constantly in their orbits and the larynx opens and closes incessantly; the lower jaw meantime, is fixed open."

We need not go on with these awful experiments. What shall we say to evidence like this,—evidence based entirely upon vivisection? Eighty horses and other domestic animals, worn-out in the service of man, die in torment under the hands of Chauveau to prove the sensibility of the spinal cord; twenty species of animals, in unknown and unreckoned numbers, are sacrificed by the prince of vivisectors, Brown-Sequard; Dalton tells us, as the result of vivisections, that at certain points the sensibility of the spinal cord is "unquestioned"; Flint, reporting the "positive results" of his own vivisections, tells us that a certain part of the spinal cord is "very sensitive;"—and yet, to break the force of a charge of cruelty in which he was not concerned, the Surgeon-General of the United States Army dared to stand up in the presence of a Committee of the United States Senate, and inform its members that *"the spinal cord is not sensitive, . . . there is no sensitiveness of the spinal cord!"*

Really, is Surgeon-General Sternberg a trustworthy witness upon matters pertaining to the vivisection of animals?

To what extent has vivisection beneficially influenced the present practice of medicine? In the formation of an opinion on this subject, the world relies principally upon the statements of practising physicians whose broad experience should have qualified them to know the truth, and in whose integrity, accuracy and good judgment it is believed that confidence may be placed. Of all the statements upon this subject laid before Congress and printed in the Report No. 1049, there is none that would naturally exert greater influence than that of Dr. S. C. Busey, the president of the Medical Society of the District of Columbia. The official position of this writer, the high personal esteem in which he is held, and his half-century of medical practice, all com-

bine to invest his opinions with an authority and a weight far beyond that of the average practitioner. Nevertheless it may be doubted whether in all the literature of pro-vivisection, there can be found in so brief a space an equal number of absurd, extravagant or untrue statements due to ignorance or misguided zeal.

Starting out with the affirmation that the bill before Congress means, not that vivisection shall be regulated, but that it shall be "positively prohibited," he quotes in proof of this the following words:

"The animal must, during the whole of the experiment, be completely under the influence of ether or chloroform to prevent the animal feeling pain; and

(*d*) The animal must, if the pain is likely to continue after the effect of the anæsthetic has ceased, or if any serious injury has been inflicted on the animal, be killed before it recovers from the influence of the anæsthetic which has been administered."

This is not an accurate quotation from the only bill considered by the Senate committee at the hearing of April 17, 1896. The most important sentences in the clause are omitted from the above quotation—sentences which, had they been permitted to appear, would utterly disprove the statement that the bill "prohibited" all animal experimentation. This is the clause of the bill then under consideration:

"(*c*) The animal must, during the whole of the experiment, be completely under the influence of ether or chloroform sufficiently to prevent the animal from feeling pain, excepting only that in so-called inoculation experiments or tests of drugs or medicines the animal need not be anæsthetized nor killed afterwards, nor in tests of surgical procedure need animals be kept completely anæsthetized during the process of recovery from the surgical operation. Otherwise than this the animal must be kept from pain during all experiments; and

(*d*) The animal must, if the pain is likely to continue after the effect of the anæsthetic has ceased, or if any serious injury has been

inflicted on the animal, be killed before it recovers from the influence of the anæsthetic which has been administered."

It will be seen that if the omitted words had been read the charge of prohibiting all vivisection would at once have been seen to be untrue. So far from prohibiting, the bill before Congress distinctly permits lines of experimentation which the health officer, Dr. Woodward, declares "include nearly all the vivisection done in the District." Who was responsible for an omission so vital; for garbling worse than a crime?

The truth is that this address was not made before the Senate committee at all. It was read nearly three months before, at a hearing before the Commissioners of the District, and had no reference to the amended clauses of the bill as discussed before the Senate committee. Who was it that decided that this address, containing statements wholly untrue of the measure under consideration, should, nevertheless, without a word of explanation, go before the Senate and people of the United States as pertinent and truthful criticism? I am free to say that I very much doubt whether that responsibility belongs to the president of the medical society or to any member of the medical profession. It is not difficult to discover where, in all probability, the responsibility must lie for a trick more worthy of a ward politician than a man of honor.

But in his eagerness to impress the Senate committee with the importance of animal experimentation, and to prevent if possible its control by the Government, the president of the medical society permitted a too vivid fancy to carry him far beyond the regions of scientific truth. The habit of mind which tends to exaggerate and magnify a fact is far more opposed to scientific progress than the mental skepticism which doubts, questions, debates, and yields credence only to overwhelming proof; and the mental attitude of Dr. Busey seems to be a natural leaning toward the marvelous.

It is quite impossible to point out all the unscientific assertions and mistakes contained in this single paper, and put forth in all apparent seriousness by an educated physician. Think of the representative of medical science in the city of Washington soberly assuring the Senate of the United States that experiments upon living animals have opened such possibilities to surgery that people who were once "worse than dead, living simply as animals, have been restored to such life that they are again useful, and is leading up to the point that *we may be enabled to save the lives of that vast number of people who are suddenly stricken with apoplexy!*"* Idiocy already cured,—apoplexy to be remedied by a surgical operation? A "vast number of lives" thus to be saved? Look for a moment at the facts. In England and Wales, during four years, 1894-1897, there died from apoplexy 68,325 men and women.† Of this great number no less than 53,527, more than three-fourths, were past the age of 55. I can not bring myself to believe there is another physician in the District of Columbia who does not know that the apoplexy of people past the age of 55 is due for the most part to degenerative changes in certain vital organs, and especially in the cir-

*Report 1049, p. 94.

†The actual mortality from apoplexy in England and Wales is as follows:

	Men.		Women.	
	Over 55.	All Ages.	Over 55.	All Ages.
1894	5709	7372	6711	8725
1895	6220	7902	7400	9325
1896	6111	7811	7292	9353
1897	6449	8171	7635	9666
Total	24489	31256	29038	37069

For either sex, the proportion of deaths over 55 is almost exactly 78 per cent. of the total number.

culatory system, degenerations utterly beyond the reach of any possible surgery to "cure." If such a statement, implying the future "cure" of apoplexy—a disease essentially of advanced life—by any medical or surgical means to be discovered through vivisection, was put forth, not to win a Senator's vote, but in all honesty and seriousness, then it reveals a condition of ignorant optimism almost inconceivable as existing outside the Middle Ages.

But this is not the only instance of assertions concerning the potentiality of experimentation at which Science herself must stand aghast. When we are told that without animal experimentation "we could not have been able at any time to have determined what disease was, *or to have distinguished diseases,*" I do not hesitate to say that not only is the assertion scientifically untrue, but that its untruth must be evident to every educated physician in the United States. Undoubtedly experiments upon animals, chiefly inoculations, have thrown light upon the origin of the infectious diseases; but the assertion goes far beyond this, and claims that "we could not have been able *at any time . . . to have distinguished diseases,*" and that statement is absurd. Why, in barely eight consecutive lines there are no less than eight deliberate affirmations regarding vivisection and its potency, every one of which, from a scientific standpoint, is untrue! Referring to certain knowledge, to the sum of which inoculation experiments have no doubt contributed, Dr. Busey proceeds to say of it:

"Without this we would be utterly powerless *to treat any disease.* We might be even worse, utterly powerless to recognize the difference between diseases. Simply take that disease now so prevalent here, typhoid fever. Less than a hundred years ago, not farther back than 1830, it was confounded with typhus fever, which we now know, through experimentation, is a very different and *more curable* disease. In fact, *our whole knowledge of typhoid fever,* as to its cause, how to eradicate it, *and how to cure* it, is due to animal experimentation."

It would seem impossible for the wit of man to crowd into eight lines more unscientific exaggerations and perversions of fact than are here put forth by one of the leading medical practitioners of the national capital. "Utterly powerless to treat *any* disease," but for knowledge gained by vivisection! What, not even a case of mumps or measles? "Utterly powerless to recognize the difference between diseases"? Can any man of ordinary intelligence believe, even on the authority of the president of the Medical Society of the District of Columbia, that but for vivisection, medical science could not to-day "recognize the difference between diseases" so as to distinguish epilepsy from whooping cough, apoplexy from smallpox, or cancer from convulsions? The absurdity of such a wide-sweeping statement is evident to everyone. "Through experimentation" the distinction between typhus and typhoid fever was learned? How was it possible for the president of a medical society to make a statement so absolutely untrue, merely to enhance the demand of professional vivisectors to be above control? Instead of being due to vivisection, it was by the careful study of symptoms at the bedside, or by the observation of post-mortem lesions, that Prost in 1804, Louis of Paris in 1828, Gerhard of America, and Lombard of Switzerland in 1836, Jenner of England in 1846, my old and revered masters, Drs. Murchison and Peacock of London, and others too many to name, discovered and made known the evidence which led to that distinction between the fevers which we recognize to-day. Typhus fever discovered "through experimentation" to be a "more *curable* disease"? Is it possible, at the close of the nineteenth century, after all the labors of Forbes and Bennett in England over half a century ago, of Bigelow here, and in defiance of a long array of leading medical authorities, that any living man can pretend to have learned, through vivisection or otherwise, how to "cure" a fever? Yet, in no less than

three different sentences, the inference is put forth that we have learned by vivisection how to cure such a disease as typhus or typhoid fever!

I deny that such knowledge exists. When was the "cure" discovered? M. Louis, of Paris, writing in 1830, declared that "a well-marked case of typhoid is not capable of being broken up." Dr. Jacob Bigelow, in his address before the Massachusetts Medical Society as far back as 1835, declared concerning typhoid, that once established "it can not be eradicated by art, but must complete a certain natural course." Says Dr. Buchanan, of the London Fever Hospital: "Typhus fever, like other diseases of its class, *can not be cured,* nor its duration shortened by any means at present known to medical science."* Dr. Austin Flint says: "The general principles of treatment in typhoid and typhus are essentially similar;" and that "the known resources of therapeutics do not afford reliable means for shortening the duration of the febrile career.† Dr. Wilson, of Jefferson Medical College, says in regard to the treatment of typhus, that "no drug or course of medication is adequate either to arrest or to shorten the course of the primary disease. . . . *No cure for typhus is known."*‡ In the face of such well-known scientific opinions as these, what can be the meaning of this representative of the medical profession, when he soberly informs Congress that by vivisection we have learned how to "cure" typhus or typhoid fever; that "how to prevent contagious diseases" and "how to cure them" is due to vivisection; or that "our whole knowledge of typhoid fever, as to its cause, how to eradicate it, and *how to cure it,* is due to animal experimentation"?

It was my fortune, a quarter of a century ago, to study at one of the principal hospitals of London under that great

*Reynolds's System of Medicine, Vol. I, p. 266.
†Flint's Practice of Medicine, p. 840.
‡Wilson's Continued Fevers, p. 300.

teacher of medical science, Dr. Charles Murchison, whose work on continued fevers is the basis of much of our present literature on this subject. As he passed from bedside to bedside, teaching as he went, surrounded by students who hung upon every word, I wonder what would have been his opinion of the statement that, in regard to typhoid fever, his long years of private practice had taught him nothing; that his thousands of cases in hospitals had taught nothing; that the researches and hospital experience of others had added nothing to his knowledge of the disease, because "our *whole* knowledge of typhoid fever, as to its cause, how to eradicate it, and how to cure it, *is due to animal experimentation!*" Why, even the suggestion that typhus fever is less generally fatal than typhoid, is a blunder. Dr. Murchison collected the histories of 18,592 cases of typhus, and the mortality was 187 per 1,000. Of 18,612 cases of typhoid, also collected by him, the death rate was 186 per 1,000, a difference so small that, as Dr. Flint points out, it shows the death-rate to be almost exactly the same.*

In some parts of Dr. Busey's statement there is hardly a sentence which does not bear the stamp of extraordinary inaccuracy. When he tells us that "medicine has not advanced except through animal experimentation;" that "all the great advances which have contributed so much to health, to society, and to life found their origin in the results deduced from vivisection;" that Simpson discovered chloroform; that the discovery was made as "the result of vivisection;" that chloroform has "saved *millions* of lives;" that Pasteur's discoveries have contributed to "the saving of *millions* of human lives;" that Galvani discovered "the application of electricity to nervous diseases," by a single experiment (when upon the very house in Bologna where Galvani lived is to-day an inscription that it was "DALLE MORTE RANE,"—upon a *dead* frog— that the experi-

*Flint's Practice of Medicine, pp. 829, 837.

ment was made); that a fact known since man began to breathe,—the necessity of atmospheric air to the maintenance of life—was discovered by vivisection; that transfusion of blood is "a process by which we can convey blood from the living *animal into sick persons* and keep them alive;" that any such process has "saved *an innumerable number from death* when every drop of blood had nearly run out of their bodies;" that Lister made surgery so safe that "there is little or no harm in it;" that Koch has "taught us how to diagnose tuberculosis long before it has reached the period when death is inevitable"—a statement wholly misleading as concerns human beings; that "preventive medicine is indebted exclusively and solely to the results which vivisection has taught us"*—in these, and in similar instances far too many, the speaker either allowed some vivisecting

*At the annual meeting of the British Medical Association, held in August, 1899, the President of the Section of State Medicine, George Wilson, M.D., LL.D., delivered an address on Preventive Medicine,—a subject upon which he is one of the greatest living authorities. Regarding the influence of vivisection upon preventive medicine, Dr. Wilson should know quite as much as Dr. Busey; and yet addressing members of the British Medical Association he said:

"Ever since the great Pasteur announced the results of his prophylactic inoculations, with respect more especially to fowl cholera and anthrax, I have been a close and, I hope, unbiased, student of bacteriological literature. I may say, too, that my attitude toward these newer methods of treatment was at first one of expectancy. . . . The more I have studied them, the more firmly I feel convinced that they are based on errors, and are the outcome of illogical inductions, every one of them. . . . After all these long years of flickering hope, *I am prepared to contend that the indiscriminate maiming and slaughter of animal life with which these bacteriological methods of research and experimentation have been inseparably associated, can not be proved to have saved one single human life, or lessened in any appreciable degree the load of human suffering.* I have ventured to make that pronouncement before, but in halting, academic fashion; I reiterate it here and now with the strongest and fullest conviction."

Bob Sawyer to impose on his Pickwickian credulity, or else permitted a too eager imagination to contradict the plain facts of science and history. How so many misstatements of fact could have been made by one occupying such a position is beyond comprehension. There is reason, perhaps, for believing that the real responsibility for statements so suggestive of ignorance, so colored by exaggeration, or so void of truth, belongs to some one more directly interested in maintaining vivisection in the District of Columbia without control, than the physician whose medical education was completed long before the practice obtained to any extent on this side of the Atlantic.

What shall we say to all this evidence of ignorance or carelessness on the part of those who would teach us? At least this: that Science deserves better service than the sacrifice of accuracy to her imaginary interests. She stands in no danger except from such defenders; certainly the legal regulation of vivisection can do her no harm. Some day it will be seen that blunders of scientists themselves, work greater injury to Science than any assaults of honest ignorance; that fidelity to fact is the sincerest homage she can ever receive; and that no greater detriment could come to her than through the unreliability and disingenuousness of men who assume to defend her with exaggeration and untruth. She is then wounded in the house of her friends.

*IS SCIENCE ADVANCED BY DECEIT?**

Not quite two centuries and a half ago, a writer whose name both in science and literature is linked to the immortality of genius, found himself engaged in controversy with a great religious order of his Church. In a series of letters, the literary merit of which has never been surpassed, he boldly charged the Jesuit casuists of his time with practical subversion of the foundation principles of Christian morality. But no charge of Pascal has so clung to reputation as that pertaining to the simple virtue of truthfulness. "How, for instance," he asks, "may a man avoid telling a lie when at the same time he is anxious to induce belief in what is false?" In such a case, he tells us, the Jesuit writer Sanchez lays down the doctrine that "it is permissible to use ambiguous terms, leading people to understand them in another sense from that in which we understand them ourselves."† This is the practice and doctrine of Equivocation. But if no equivocal terms come to mind or are available, what then may be done? In such a case one may take refuge in the practice known as Mental Reservation. Thus, says Sanchez:

"A man may swear that he never did such a thing, even though he actually did it, meaning within himself that he did not do it on a certain day, or before he was born, or understanding any other such circumstance, while the words he employs have no such sense as would discover his meaning. This is very convenient in many cases."

It must be said that the Jesuit order has always denied its responsibility for this kind of teaching, even though it was promulgated by casuist writers belonging to the Society.

*From Senate Document No. 78. Fifty-fifth Congress. 1899. Revised.

† Pascal's Provincial Letters, No. IX.

Certainly, the practice of equivocation and mental reserve is no modern invention, but is as old as the race. Diplomacy so often makes use of words in a double sense that Talleyrand declared language invented to conceal thought. There are nations so imbued with mendacity that they have lost the confidence of their fellow-men. For, however productive of gain they may seem at first, duplicity and deceit have their drawbacks. No man, and no society of men, convicted of habitual resort to the practice of mental reservation or equivocation can permanently retain the trust and confidence of society. And the purpose of this paper is to ask whether this ignoble practice has not come to be, along certain lines, a part of the practical policy of certain scientists in their relations with the public? Is Science advanced by duplicity and honored by deceit?

Let us admit at the outset that this practice of equivocation is by no means of universal or even general adoption among men of science. With the great majority of those whose object in life is to ascertain truth and to promulgate it, there is, happily, no temptation to depart from the strictest veracity. Scientific researches are, for the most part, heartily encouraged by the spirit of our age. Nobody questions the moral right of the geologist, the chemist, the botanist, the electrician, or the astronomer to follow lines of research in any direction desired. Their task is an honored one. It is only when we come to that department of scientific investigation which deals with the phenomena of life that questioning murmurs arise. The morality of a practice engaging the time and energy of a large body of scientific men is questioned, impugned, or denied. There are charges of cruelty, and of a pitilessness which is closely allied to vice. Human nature would be different from what it is, if the men engaged in the habitual practice of vivisection as a means of earning their daily bread could remain unmoved and indifferent. What is the reason, they ask,

that the world should manifest such special curiosity regarding the methods of the physiologist or pathologist? Why should it be asked that their laboratories be made subject to State inspection any more than the observatory of an astronomer? Why should they be obliged to report what they do with dogs, any more than the chemist what he does with his drugs or the geologist with his specimens? The professional vivisector may come to be indifferent to the sight of suffering in an animal; but apathy ceases when he is charged with a vice, and when those whom he has met in society decline to recognize him on the public street.

What shall he reply to such charges? Shall he boldly deny the existence of anything approaching cruelty? How is it possible, against overwhelming proofs to the contrary?

"I recall to mind," says Dr. Latour, "a poor dog, the roots of whose vertebral nerves Magendie desired to lay bare, in order to demonstrate Bell's theory, which he claimed as his own. The dog, mutilated and bleeding, twice escaped from the implacable knife, and threw its front paws around Magendie's neck, as if to soften his murderer and ask for mercy. I confess I was unable to endure that heartrending spectacle." In the documents laid before Congress by various scientific bodies, the name of Magendie is always mentioned with respect, but we venture to say that there is not a scientist in Washington whose name stands as high as that of the late Thomas Henry Huxley, who declared in the report of the Royal Commission: "It is not to be doubted that inhumanity may be found in persons of very high position as physiologists. We have seen it was so in Magendie." Without changing the definition of the word "cruelty," it is impossible in the face of evidence to claim for vivisection, exemption from its stain.

Shall the whole truth about vivisection be freely admitted? That is not an unreasonable demand. We doubt if it would lead to that utter condemnation of the whole practice which

so many scientists seem to fear. But what if statement of the "whole truth" would only intensify the demand for reform? Dr. Klein told the Royal Commission the whole truth in regard to his own practices, and doubtless has regretted ever since his unexampled veracity. One line of defense remains, but we may be sure that it is one to which no man of scientific training ever consciously resorted without loathing and self-detestation. It is the practice of exaggeration, Equivocation, and Mental Reserve. To the world at large they may seem to deny every charge of cruelty and uselessness, and may have their denials indorsed and supported by the principal scientific bodies of the United States, if only they will adopt the maxim laid down by the Jesuit casuist nearly three hundred years ago, declaring that when one desires to avoid telling a lie, and yet induce a belief in what is false, "*it is permissible to use ambiguous terms, leading people to understand them in another sense from that in which we understand them ourselves.*"

Has this been done? In the defense of the unlimited vivisection of animals, is it true that the names of scientific men of the highest repute may be found attached to statements and denials of charges which apparently were meant to be understood by the general public in a sense contrary to the truth? Worse even than this, has equivocation been used in appeals made to the Congress of the United States solely to hinder and prevent any possible legislation on the subject of vivisection? We propose to examine a single document—Senate Report No. 1049—and to point out some of the many misstatements, evasions, and exaggerations therein made by scientific men and scientific societies regarding—

I. The alleged painless character of inoculation experiments.

II. The extent to which animal experimentation is painless, because anæsthetics are employed.

III. The denial of any cruelty in the practice of Vivisection and the value of such denial.

IV. The exaggeration of benefit to Humanity.

Taking these topics in their order, let us see whether misstatement exists, and if it is due to ignorance or design.

I. *Are Inoculation Experiments Painful?*

On the evening of April 22, 1896, the MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA met, and, without a dissentient voice, adopted a memorial to Congress in opposition to any regulation of vivisection. Therein they say:

"As a matter of fact, anæsthetics are habitually administered in experiments which involve an amount of pain worthy of consideration; but they are not considered necessary in trifling operations, such as the administration of a hypodermic injection or the vaccination of a calf." (p. 129.)

We could hardly have more emphatic assurance of the universal use of anæsthetics, except in trifling operations, than is here given on the good faith of the Medical Society of the District of Columbia.

The NATIONAL ACADEMY OF SCIENCES also unanimously assures Congress that—

"In modern laboratories anæsthetics are always employed, except when the operation involves less suffering to the animal than the administration of the anæsthetic, *as in the case of inoculations*, or in those instances in which the anæsthetic would interfere with the object of the experiment." (p. 128.)

Here, too, we have the most explicit assurance that if anæsthetics are omitted in inoculation experiments it is only because the pain is too trivial to make it worth while to use them. Are these assurances the truth, or are they, on the contrary, an ignoble equivocation?

What is an "inoculation?" In medical works it is defined as "the insertion of virus into any part of the body in order

to communicate a disease." An experiment made by means of inoculation means, therefore, that the virus, the poisonous germs of some particular disease, such as cholera, yellow fever, tuberculosis, or rabies, has been inserted—usually by means of a hypodermic needle—into some part of the body of a living animal, beneath its skin, into the abdomen or the chest, within the eye, or upon its scraped surface. When the writer was at Calcutta, in India, a few years ago, they were inoculating monkeys with the venom of the cobra in a series of experiments that, after all, came to no practical result. Thus, in the *Journal of Physiology,* Sewell, of Michigan, tells us of inoculations made by him with rattlesnake poison, using pigeons as subjects, and recording that the head rests on the floor, the mouth open, the respiration gasping, and the body convulsed.* Thus Ernst, of Harvard, inoculated with the virus of rabies, by means of trephining the skull, some thirty-two rabbits, the animal becoming so changed in its natural disposition that from being "lively and affectionate, it becomes dull, sluggish, and even fierce," and so losing the power of swallowing that at first he supposed that they died of starvation.† Thus Cheyne, of England, tells us that "on many occasions I have inoculated portions of synovial membrane and pus from strumous joints, subcutaneously or *into the anterior chamber of the eye,* in rabbits and guinea pigs, and have invariably produced typical tuberculosis by this means." The animals in some of his experiments were not killed for weeks.‡ Thus Klein, of London, the scientist who affirmed that, for himself, he had "no regard at all" for the animals he vivisected, tells us of experiments made by inoculating the eyes of cats with the virus of diphtheria. He records that after such inoculations, in one case "the disease set in with great

* Journal of Physiology, Vol. VIII, p. 206.
† Jour. Med. Sciences, April, 1887.
‡ British Medical Journal, April 11–18, 1891.

intensity," both eyes being closed and the animal living until the seventeenth day; that in another cat, which lived for fifteen days, a "deep, crater-like ulcer" had formed, the eye being much congested, swollen, and coated with purulent matter; that in a third cat the disease steadily increased until the middle of the third week, although great congestion began on the fourth day, and the experiment lasted till the eye became perforated.* Do we need to tell anyone that such "inoculations" were by no means "trifling" in the amount of pain they caused?†

While in Paris recently the writer visited the Pasteur Institute and was shown over the establishment. There were over 2,000 rabbits awaiting their fate. But neither the great number of victims to research, nor the vast iron cage with the dogs tearing at their chains so impressed memory, as the scores of rabbits lying in their compartments slowly dying, the result of inoculations which the AMERICAN ACADEMY OF SCIENCES informs Congress "involved less suffering than the administration of an anæsthetic!"

One inoculation experiment of this kind has for us a special and peculiar interest. In the AMERICAN JOURNAL OF MEDICAL SCIENCES for July, 1882, Dr. George M. Sternberg, now the Surgeon-General of the United States Army, gave to the world the startling discovery he had made through experiments in blood poisoning. "I have demon-

* Sup. to XIXth Annual Report, Local Gov. Board, 1889–1890.

† "Inoculations into the anterior chamber of the eye of rabbits and other animals have frequently been practised, and offer certain advantages in the study of the local effects of pathogenic organisms. . . . Inoculated animals should be carefully observed, and a note made of every symptom indicating departure from the usual condition of health, such as fever, loss of activity, loss of appetite, weakness, emaciation, convulsions, dilated pupils, the formation of an abscess, or a diffuse cellulitis extending from the point of inoculation."—A MANUAL OF BACTERIOLOGY, by George M. Sternberg, M.D., Surgeon-General U. S. A., pp. 97–99.

strated," he tells us, "by repeated experiments, that my saliva . . . injected into the subcutaneous connective tissue of a rabbit, invariably produces death, usually within forty-eight hours. . . . I think I am quite safe in stating that I have repeated the experiment at least twenty-five times with my own saliva. I beg those who undertake to repeat my experiments to observe that *my* saliva produced results recorded. The saliva of four students, residents of Baltimore, gave negative results. . . . . In my experiments the rabbits were commonly found dead or dying on the second morning after inoculation. The constant pathologic lesion found by me was a diffuse cellulitis or inflammatory œdema, extending in all directions from the point of injection. The spleen was usually greatly enlarged; the liver was usually dark in color and gorged with blood."

In his "Manual of Bacteriology," Dr. Sternberg claims to have discovered through these experiments a microbe, which he tells us, is now supposed to be concerned in the production of one form of pneumonia. Whether or not this theory is correct, the treatment of pneumonia has remained precisely the same, since this peculiar discovery was made. But what we wish especially to emphasize is the fact that an inoculation experiment, so far from "involving less suffering to the animal than the administration of an anæsthetic," may produce severe and prolonged anguish for days and weeks. Was this fact known to the members of the scientific bodies whose statements to the contrary I have quoted? Every man knew it. How, then, could the MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA dare to assure the Senate of the United States that an experiment of this character was "a trifling operation," or the NATIONAL ACADEMY OF SCIENCES declare that they "involved less suffering to the animal than the administration of the anæsthetic?" Well, until somebody "rises to explain," we

can only speculate. Let us imagine this memorial brought up for adoption before one of these learned societies. Suddenly a member finds himself on his feet. "Mr. President, I do not see how I can give my vote for that memorial as it stands. Every one of us present to-night is aware that an inoculation experiment involves far more suffering to the animal, as a rule, than the administration of the anæsthetic; that, sometimes, it means prolonged and extreme pain; and yet we, as a society, are assuring Congress and publishing to the world, upon our honor as scientific men, that in this class of experiments anæsthetics are not used because the pain is so trifling!* That, sir, is a falsehood; and I can not vote for a lie." Then, we may fancy some sturdy vivisector, who perhaps drew up the memorial, rising to reply. "Mr. President, this is a matter of more than ordinary importance. At any cost, we must prevent the bill before Congress from becoming a law. Nobody has asked us to define what we mean *in the laboratory* by an 'inoculation experiment.' Suppose, for the present purpose, we define such an experi-

* A typical instance of equivocation, apparently, may be found in the use made of a quotation from a letter by Surg.-Gen. Sternberg, in the "Memorial from the Representatives of Medical and other Scientific Societies of Washington," printed in Senate Document 107, Fifty-fifth Congress. The italics are as in the original, and their purpose is but too evident:

"The experiments which have been conducted at the Army Medical Museum since I have been Surgeon-General of the Army and, so far as I am informed, previous to that time, relate principally to the cause and prevention of infectious diseases, and to the results of disease processes (pathology). *These experiments do not call for any painful dissections, but consist in the subcutaneous inoculation of cultures of various pathological bacteria, etc.*"

This is signed by Dr. S. C. Busey, Dr. Sternberg, D. E. Salmon, (a veterinary surgeon), and others, and they affirm that it "applies as well to other Government laboratories in this city, where biological research work (vivisection) is conducted." Could anything be plainer than the inference it was evidently designed that the Senate should draw from the words so carefully italicized?

ment as *the prick of the needle by which the virus is inserted* into the tissues. That, certainly is 'a trifling operation'; and I think, with this definition in his mind, even our moral young friend can vote for the memorial. There is no doubt that Congress will accept what we say as the truth, if only we are unanimous." Perhaps such debate never occurred, but only on some such hypothesis is it conceivable how men of science, without a dissenting voice, could give assurances so false.* Even in its best aspect, it was an equivocation. Was it honorable dealing with the National Legislature? Was it in harmony with the ideals of Science? Rather, was it not in perfect accord with the maxim of Sanchez, that when one is desirous to induce belief in what is false, *"it is permitted to use ambiguous terms, leading people to understand them in another sense from that in which we understand them ourselves?"*

* In his Presidential Address in the Section of State Medicine at the last Annual Meeting of the BRITISH MEDICAL ASSOCIATION in August, 1899, Dr. George Wilson, LL.D., probably the leading authority in Great Britain upon Preventive Medicine, made the following indignant reference to these ignoble equivocations:

"I boldly say there should be some pause in these ruthless lines of experimentation. . . . I have not allied myself to the Anti-vivisectionists, but *I accuse my profession of misleading the public as to the cruelties and horrors which are perpetrated on animal life.* When it is stated that the actual pain involved in these experiments is commonly of the most trifling description, *there is a* SUPPRESSION OF THE TRUTH, of the most palpable kind, which could only be accounted for at the time by ignorance of the actual facts. I admit that in the mere operation of injecting a virus, whether cultivated or not, there may be little or no pain, but the cruelty does not lie in the operation itself, which is permitted to be performed without anæsthetics, but in the after-effects. Whether so-called toxins are injected under the skin into the peritoneum, into the cranium, under the dura mater, into the pleural cavity, into the veins, eyes or other organs—and all these methods are ruthlessly practiced—*there is long-drawn-out agony.* The animal so innocently operated on may have to live days, weeks, or months, with no anæsthetic to assuage its sufferings, and nothing but death to relieve."

II. *Are Anæsthetics so used in Vivisection as Completely to Abolish Pain?*

We propose to show that statements, carefully calculated to convey such an impression, were made to Congress for the purpose of influencing legislation; that such impression is absolutely false, and that these statements are entirely in accord with the doctrine of Equivocation.

The Joint Commission of the Scientific Societies of Washington, in their memorial to Congress, asserts that "those engaged in research work . . . may be trusted to conduct such experiments in a humane manner, *and to give anæsthetics when required to prevent pain.*" (p. 130.) Here is a distinct implication that whenever "anæsthetics are required to prevent pain" they are given; and yet every member of the commission who knew anything whatever about vivisection must have known that such meaning of their words could not possibly be true.

A year later apparently the same body, but now styling itself a "joint committee" of various local societies, presented another appeal to Congress, stating: "It is the uniform testimony of those who have had the best opportunities for obtaining reliable information on this subject that in the pathological laboratories in this District, and in the United States generally, anæsthetics are habitually employed for the relief of pain, *whenever it is practicable to give them,* and when the amount of pain involved is such as would call for the administration of an anæsthetic, if the operation were to be performed upon a human being." (Senate Doc. 107, p. 22.) The ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES adopted without alteration the memorial of the AMERICAN MEDICAL ASSOCIATION, assuring Congress that "anæsthetics are *habitually administered to animals subjected to painful experiments*" (pp. 131, 132); the MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA affirms that "anæsthetics are *habitually administered*

in experiments which involve an amount of pain worthy of consideration (p. 129); the NATIONAL ACADEMY OF SCIENCES declares that "the suffering incident to biological investigations *is trifling in amount;*" the NEW HAMPSHIRE MEDICAL SOCIETY asserts that "anæsthetics are habitually administered to animals subjected to painful experiments;" and, finally, the Surgeon-General calls for proof that "those engaged in experimental research do *not* administer anæsthetics to the domestic animals when they are subjected to painful experiments in this District" (p. 125).*

And now, bearing in mind that each of these statements was drawn up by a man of science, trained to the use of accurate expression, and that it was put forth solely to influence Congress against legislation, what is the meaning that a plain man, unused to the subtleties of evasion and equivocation, would find in the passages here quoted? It is doubtful if he notes at first glance that nearly all these assertions are purposely indefinite, and that nowhere is it precisely stated that anæsthetics are effectively used, but only that they are "habitually" administered. What would seem clear to the average man is this: that some of the most eminent scientific men in the United States give their word of honor to the National Legislature that anæsthetics are so given in animal experimentation as practically to annihilate pain, or, if any pain be felt, it is so slight, so "trifling in amount," so similar to that which we endure every day without a thought of anæsthesia, that it is not "worthy of consideration." That is the inference which, apparently, it was intended that members of Congress should draw from the statements quoted. And that inference is false.

* The proof is furnished by the Surgeon-General himself. His saliva-experiments were certainly without anæsthetics, and as certainly productive of pain. Unless otherwise specified, all references are to Report 1049.

The exact truth in this matter was perfectly well known to every member of these distinguished societies.

First. The effectual administration of an anæsthetic so as to abolish pain is, as a rule, utterly impracticable in that great class of inoculation experiments to which attention has just been called. Anybody can see that you can not insert virus into the eye or the abdomen of a cat, for instance, and then stand over it night and day administering an anæsthetic; the thing is never even attempted. When Surgeon-General Sternberg demonstrated by experiments upon over twenty-five rabbits his immortal discovery that his saliva, injected beneath the skin, set up all the symptoms of the severest blood poisoning, he certainly did not give them anæsthetics during the entire period of their torment, for he tells us they were "found dead or dying" the second morning after inoculation. But demonstration of the point is quite needless; the facts are admitted. Dr. Woodward, the health officer of the District of Columbia, has stated that "most of the experiments in bacteriology (which includes nearly all of the vivisection done in this District), and a very large proportion of those for other purposes, require that the animal shall be kept alive sometimes for weeks after the effect of the anæsthetic has passed off" (p. 124).* We are therefore indebted to him for revealing, that in the experimentation which goes on in this District, a large majority of the animals must be kept alive for a considerable time.

Second. In a large number of other experiments upon living animals, some of them involving prolonged and extreme pain, it is practically impossible to relieve suffering by anæsthetics, unless it be during the brief preliminary cutting operation, when that takes place. In the experi-

*Does Dr. Woodward mean to imply that in "experiments in bacteriology" anæsthetics are administered? Such is the impression conveyed by the above quotation.

ments of Luciani on the starvation of dogs; of Colin, in freezing animals alive; of Chauveau, who tells us that he "consecrated" some eighty horses and asses to experiments on the spinal marrow, producing "intense" and "most violent pain;" in experiments on the reflex action of sensory nerves; in experiments connected with the glandular secretions; in experiments with certain poisons and drugs; in many experiments upon the heart and the circulation, and, in short, whenever the evidence of pain is important to the investigation—complete and genuine anæsthesia throughout the experiment is quite impossible. There are many experiments in surgery where complete anæsthesia can not be maintained. You may, indeed, confer some mitigation of pain by the use of narcotics, such as morphia and chloral, but neither of these is an anæsthetic. As the great experimenter, Burdon Sanderson, has said, "You cannot produce inflammation in an animal, and maintain a state of anæsthesia during the whole process."

THIRD. In addition to these, there are various other experiments, which, if done at all (and their utility is very questionable), must be done under the influence of *curare,* a poison which simply makes the victim incapable of the slightest muscular movement, although conscious of what goes on about it and sensible to every pang.

"An animal under its influence," says Professor Holmgren, the professor of physiology at Upsala University, "it changes instantly into a living corpse, which hears and sees and knows everything, but is unable to move a single muscle; and under its influence no creature can give the faintest indication of its hopeless condition." This venom is, he says, *"the most cruel of poisons."** The French vivisector, Claude Bernard, tells us that it "destroys the power of movement, but permits sensibility to exist;" that the "cadaver one has before him hears and compre-

* Holmgren's Physiology, p. 231.

hends what goes on about him, *and feels whatever painful impressions we may inflict.*" In a memorial issued last year against legislation, a writer is quoted as stating that "it has never been claimed by any scientific man that it (*curare*) is an anæsthetic." But it is used in every laboratory in America where vivisection goes on to any extent, and one of the principal government vivisectors,—who is not a physician but an experimenter,—Charles Wardell Stiles, insists in his statement to Congress (p. 104) that its use "is a point which should be left entirely to the investigators."

To illustrate its use in laboratories, let us examine the experiments of Dr. H. G. Beyer (a Government employee at the United States National Museum), made upon a large number of dogs. Morphia being administered, the animal is fastened in a "dog holder," tracheotomy performed, a vein dissected out, and "about half a dram of a one per cent. solution of *curare* is injected, after which artificial respiration is begun." The animal is now as solidly fixed to the table as if it were chained, though entirely sensible to pain, and conscious of whatever goes on about it. We need not go into all the details of his experiments—the dividing of nerves, the dissecting out of arteries, the insertion of cannulas, until finally "the whole front and sides of the thorax are cut away and the right subclavian artery dissected out and tied."* They are mentioned only to show that animals, twenty-five or thirty in number, may be slowly dissected alive without anæsthetics; that their death under *curare* may be accompanied, as Claude Bernard puts it, "by sufferings the most atrocious the imagination of man can conceive;" that all this may be done by one of the paid servants of the United States, and yet the Medical Society of the District of Columbia can soberly assure Congress that "as a matter of fact, anæsthetics are habitually administered

*American Jour. Med. Sciences, April, 1887.

in experiments which involve an amount of pain *worthy of consideration!*" No wonder an English experimenter once declared that "anæsthetics do more to lull public opinion than to mitigate animal suffering."*

And now, why was the truth concealed from Congress in this matter of anæsthetics? If, in so much of animal experimentation it is impossible to give complete immunity from pain, why was not the fact admitted? The reason is not difficult to guess. To admit that in a vast number of cases the practice of vivisection as carried on to-day necessarily implies torment, would be to admit the reasonableness of some measure of State inspection and control. Might not that admission be avoided? In one way only. With juggling of words it might be possible to conceal the truth. Unfortunately for the true interests of Science and for the honor of those who assume to speak in her behalf, that course of equivocation was followed out.

* In her statement before the Senate Committee, February 21, 1900, Dr. Mary Putnam Jacobi furnished an additional illustration of the baneful influence of vivisection upon the sense of accuracy and the capacity for stating facts. Referring to the writer she says:

"He does not seem to know as much about the dormitive powers of opium as did the doctors of Molière, and severely condemns Dr. Beyer for an experiment on artificial respiration, because morphine was employed instead of ether or chloroform."

A lady with the experience in vivisection which Dr. Jacobi has enjoyed must know perfectly well that (as Claude Bernard has shown in his "Leçons de Physiologie opératoire," p. 115) morphia is *not* a true anæsthetic, whatever might have been the opinion of Molière's physicians two hundred years ago; that the above reference to Beyer's vivisections was to illustrate the use of *curare*, not morphia; that Beyer did not make "an experiment on artificial respiration," but thirty to forty experiments on different animals by exposing and isolating the heart; that the "whole front and sides" of a dog's chest are never "cut away" simply "for an experiment on artificial respiration," and that the above criticism is directed not to cruelty but to falsehood.

III. *Is there any Cruelty in Vivisection?*

Within the past hundred years the ethical ideals of civilization have so far advanced that cruelty to animals, so long a matter of indifference, is to-day regarded as the manifestation of depravity and vice. To the charge of cruelty, therefore, the American vivisector is justly sensitive; and his sensitiveness finds frequent expression in the various memorials made to Congress. Thus the MEDICAL SOCIETY OF THE DISTRICT OF COLUMBIA states with some caution that "so far as we know no evidence has been adduced that *cruel* and unnecessary experiments are being performed in this District." One can not withhold admiration for the diplomacy which does not deny the fact, but only the lack of evidence pertaining to the present time and present place. The CHEMICAL SOCIETY of Washington declares that those who ask for legislation have not been able "to show a single instance of *cruel* experiments conducted in the District of Columbia" (p. 138). The ENTOMOLOGICAL SOCIETY of Washington affirms that it knows of "no *cruel* experiments which have ever been performed in the District of Columbia by any of our colleagues," whatever that may mean. And, finally, the ASSOCIATION OF AMERICAN PHYSICIANS, in a memorial to which are attached the names of the leading vivisectors of America, asserts that "we have been unable to learn that there has been a single instance in which abuse has been made of the practice of animal experimentation in the Government laboratories, the medical schools, or the universities of the District of Columbia" (p. 136).

Are these statements true? They would not be equivocations if in some sense they were not the truth. To the average man they appear to deny in the most emphatic manner the implication that any cruel experimentation ever

occurred in the District of Columbia. Wherein lies the possibility of equivocation? In the definition of the word "cruelty." That word has one meaning for the general public, but an entirely different significance for the vivisector. It is very easy to assert, as these societies have done, that no cruel experiments occur in the District of Columbia, simply because *as cruelty is defined by the professional vivisector, it is practically impossible for him to perform a cruel experiment.*

Let us study certain cases of what persons, without scientific training, might be greatly inclined to stigmatize as cruel experiments. In an address delivered before the MASSACHUSETTS MEDICAL SOCIETY, the professor of Surgery in Harvard Medical School,—Dr. Henry J. Bigelow,—gave a description of certain phases of experimentation he had witnessed in a foreign country and which, he declared, "transcended but little the scenes witnessed in a physiological laboratory." A wretched horse,—one of many hundreds,—"broken with age and disease resulting from life-long and honest devotion to man's service, was bound upon the floor, his skin scored with a knife like a gridiron, his eyes and ears cut out, his teeth pulled, his arteries laid bare, his nerves exposed and pinched and severed, his hoofs pared to the quick, and every conceivable and fiendish torture inflicted upon him, while he groaned and gasped, his life carefully preserved under this continued and hellish torment, from early morning until afternoon." Why was this done? "For the purpose, it was avowed, of familiarizing the pupil with the motions of the animal!" Was it *cruelty?* Or take the experiments of Professor Goltz, who found it "marvelous and astonishing" that a dog wnose spinal cord had been cut and whose hindquarters were paralyzed,* was nevertheless able to manifest the instincts pertaining to maternity; for "she unceasingly licked the living and the dead puppy,

*The statement referred to in the first edition of this Essay that the dog's breasts were cut off, has been found to be incorrect.

and treated the living puppy with the same tenderness that an uninjured dog would manifest."*

Or suppose some Washington vivisector in one of the Government laboratories desires, out of scientific curiosity, to repeat the atrocious and perfectly useless experiments of that distinguished scientist, Professor Mantegazza. His problem was to create intense pain and at the same time to compel the creature to keep motionless in an attitude that would not interfere with its breathing. The ingenious scientist devised two methods of accomplishing his end, "either by exasperating the pain, so that its influence overcame the action of the muscles of motion, or by planting sharp and numerous nails through the soles of the feet in such a way as to render the animal nearly motionless, because in every movement it would have felt its torment the more acutely." To exasperate the pain he invented a machine, which he aptly called "a tormentor." With it, he explains, "I can take an ear or a paw and, by turning the handle, squeeze it beneath the teeth of pincers. I can lift the animal by the suffering part. I can tear it or crush it in all sorts of ways." One experiment was on a guinea pig nursing its young. A rabbit, after two hours' torment and a few moments' rest, has nails stuck into its feet in such a way that "a pain much more intense" than in some previous experiment is produced. Two little creatures are subjected for two hours to the tormentor, then "larded with long, thin nails in their limbs." They "suffer horribly, and, shut up in the machine for two hours more, they rush against each other and, not having the strength to bite, remain interlaced, with mouths open, screaming and groaning."†

All these experiments, extending over a year, were conducted, he tells us, not with repugnance, not with dislike, but "*con multo amore*"—with extreme delight. We do not

* Pfluger's Archives, Vol. IX, p. 564.

† Fisiologia del Dolore, di Paulo Mantegazza, pp. 101, 106, 107, etc.

mention these experiments as examples of the average investigations going on in laboratories; doubtless they are extreme instances. The point we desire to make emphatic is this: if such experiments as these of Mantegazza and Goltz can be performed to-day in Washington laboratories, free from any restriction or criticism of any sort; and if, notwithstanding their daily performance, the men at the head of the various vivisecting laboratories could sign memorials to Congress, asserting that "so far as we know, no *cruel* experiments have ever been made in this District;" if all this is possible, then all these denials of cruelty—of cruelty as the world understands it—are absolutely valueless. For certainly if these experiments are not cruel, there is no cruelty in scientific research.

Well, in the first place, just such experiments are entirely possible in any of the Government laboratories of Washington, if, in the opinion of the scientific vivisector at the head of such laboratory, they are "properly conducted." The only law applicable to such experimentation is the act of February 13, 1885 (*23* Stat., 302), which says:

> Sec. 15. Nothing in this act contained shall be construed to prohibit or interfere with any properly conducted scientific experiments or investigation, which experiment shall be performed only under the authority of the faculty of some regularly incorporated medical college, university, or scientific society.

What is there in this law that would prevent, in Washington laboratories, any number of repetitions of the experiments of Mantegazza and Goltz? Mantegazza has for some time contemplated a visit to this country. Is there a vivisector in Washington who dares to put himself on record that, according to the ethics of the laboratory, this physiologist's investigations were "improperly conducted?"

Secondly, the "cruelty" of such experiments could be denied. One of the leading scientific societies of Washington defines cruel experiments as those in which "there is an

unjustifiable infliction of pain." What, to a vivisector, is an unjustifiable infliction of pain? It is the infliction of more pain than is necessary for the success of the experiment. "Cruelty" as defined by six vivisectors of Harvard University, "is the intentional infliction of *unnecessary* pain." But who is to judge how much or how little pain is "necessary?" Who is to decide whether the subjection of the animal to prolonged torture is of the slightest value? Who, according to the scientific societies of Washington, should be the supreme and only judge of the vivisector? *The vivisector himself!*

You say that this is impossible? You can not believe that any scientific society would so juggle with a question of right or wrong as to make the morality of an act depend solely on inclination of the person who does it? Incredible as it may seem, that is precisely what has been done, and that position constitutes to-day the principal difference between the AMERICAN HUMANE ASSOCIATION and the various scientific societies of the United States. We say that Congress should by law stamp its disapproval of wanton and infamous experiments such as those of Mantegazza and Goltz. "No," say the advocates of free vivisection, "let the vivisectors alone decide what they may do." In the report to Congress from which quotation has been made, there appears a statement signed by the leading vivisectors of the United States. "As to whether or no, under given circumstances of research or teaching, an experiment involving pain should be performed, *is a matter which should rest with the responsible expert by whom, or under whose direction, the thing would be done*" (p. 60). To that declaration of a vivisector's right to be above all criticism or control, we find the names of Daniel E. Salmon, of Charles Wardell Stiles, of Surgeon-General Sternberg. "We believe that those engaged in scientific investigation are the best judges of the necessity for experiments made by them, . . . and of

the methods to be employed," says the PHILOSOPHICAL SOCIETY OF WASHINGTON (p. 133). What is this but to justify the above experiments of Mantegazza and Goltz?

The joint commission of the scientific societies of Washington affirm that those engaged in vivisection investigations "*are the best judges of the character of experiments required, and of the necessity for using anæsthetics*" (p. 130). The reader is horrified, perhaps, at some of the experiments herein described; but we have only touched the outer edge of the infamy which stains the record of so-called scientific research. Yet it is all permitted, sanctioned, and approved by the scientific societies of Washington, if only it is done by a scientific vivisector! According to the new ideal of scientific morality, the only person in this universe who has the right to say whether any vivisection is right or wrong, cruel or otherwise, is the man who performs it! "Unnecessary and offensive in the highest degree would it be . . . to attempt to dictate or control *how, and by whom, and for what purposes and under what conditions . . . experiments shall be made*" (p. 135). To that horrible sentiment, unanimously approved by one of the great associations of professional vivisectors and their friends, is attached the name of Surgeon-General Sternberg. And now we should like to ask Members of Congress if they understood that all this denial of cruelty in the laboratories of the District of Columbia, was put forth with the mental reservation that nothing a vivisector might do would ever be "cruel" unless he called it so himself? Did you fancy that hidden in high-sounding phraseology was the claim, that the vivisector alone is qualified to pronounce upon the moral quality of his own actions? Of what value are all their denials of cruelty? Sanchez shall tell us: "*A man may swear that he never did such a thing, though he actually did it, . . . while the words that he employs have no such sense as would discover his meaning.*"

IV. *Is the Utility of Vivisection Exaggerated?*

Notwithstanding the opinion of that eminent surgeon, Lawson Tait, of England, that "nothing whatever has been gained by vivisection,"* it has always seemed to us more probable that in certain directions, vivisection within limitations is sometimes of such practical and potential utility as to justify its use. But in their eagerness to prevent the slightest degree of Government supervision in the District of Columbia, is it true that certain scientists have made claims of usefulness far beyond the actual truth? One sees nothing of the kind in European countries. There, the idea of utility to humanity as a reason for vivisection is laughed at. Says Professor Hermann, of Zurich University: "The advancement of knowledge, and not utility to medicine, is the true and straightforward object of all vivisection. Science can afford to despise this justification with which vivisection has been defended in England," and he might have added, "in the United States." But public sentiment in this country at present will not sanction the torment of animals unless behind it is the claim of utility or benefit to humanity. Has this claim been pushed, even by men of scientific training, beyond the limits of scientific truth? To those unacquainted with medical phraseology it is diffi-

* The late Prof. Lawson Tait, F.R.C.S., one of the most brilliant surgeons of this century, not only affirmed that vivisection was useless, but also declared that it led to erroneous conclusions. In a letter to the *Birmingham Daily Post*, Dec. 12, 1884, he says:

"Like every member of my profession, I was brought up in the belief that by vivisection had been obtained almost every important fact in physiology, and that many of our most valued means of saving life and diminishing suffering had resulted from experiments on the lower animals. I now know that nothing of the sort is true concerning the art of surgery; and not only do I believe that vivisection has not helped the surgeon one bit, but I know that it has often led him astray."

cult to make evident such exaggeration; but the task at least shall be attempted.

Perhaps the most imposing array of names attached to any memorial to Congress in regard to vivisection is that of the Association of American Physicians, a body which embraces in its membership, as before pointed out, some of the best known experts in vivisection in the United States. There, in company with leading physicians, are professors and teachers from every quarter; and experimenters such as Sternberg and Vaughan, Meltzer and Flexner, Ernst and Councilman, Adami and Wood, lift in unison their protesting voices against any hindrance to their methods or any supervision of their work. They are men of science, trained in the exactitude which science is supposed to instill. What do they tell us of the benefits which have resulted from vivisection during recent years? We may be sure in so important a document nothing has been omitted which by any possibility could be claimed.

"To mention only a few of the results obtained within recent years by animal experimentation, attention is called to the discoveries which have revolutionized surgical practice by the introduction of antiseptic methods of treatment, which have rendered infrequent the occurrence of childbed fever, which have made it possible to prevent the development of hydrophobia after the bite of rabid animals, which have furnished an efficacious method of cure of the otherwise incurable disease, myxœdema, and which, by the antitoxin treatment, have greatly lessened the fatality of diphtheria" (p. 135).

Now, admitting that experimentation has helped to teach surgery the infinite importance of the exclusion of germs by the most absolute cleanliness; and that in other directions, along lines of experimentation in nowise prevented by the limited regulation which we advocate, experiments are throwing light on other matters—admitting all this,—are the claims here made supported by facts? It may

be questioned. Here in America we have no national system of registration of deaths such as exists in every other civilized country on the globe, and we can not appeal to any national statistics of our own land. We may be sure, however, that any improvement in way of medical or surgical treatment wherever devised, is at once utilized by the physicians and surgeons of Great Britain, and that if such wonderful discoveries have been made as are claimed above, we shall find evidence thereof in the annual reports of English mortality.

1. Is it due to animal experimentation that results have been obtained "which have rendered infrequent the occurrence" of puerperal fever? THE ASSOCIATION OF AMERICAN PHYSICIANS so affirms. On the contrary, it can be proven:

(1) The basis of our knowledge concerning this disease was due to observations in hospitals; and not to animal experimentation.

(2) The disease is not yet "infrequent," judging by the statistics of a nation's mortality.

When the history of medical practice shall one day be written, there is no page we would more willingly have blotted out than that which relates to the causes and treatment of this terrible scourge. It is not only that for twenty centuries medical science was absolutely ignorant of the principal cause of this malady, and that the treatment only added to horror and increased mortality; the tragedy is that the physician himself was, in so many instances, the source of infection. One shudders at the contemplation of the slaughter that went on year after year in the great hospitals of great cities, in Europe and America as well, while medical practitioners, instead of bringing assistance, were often spreading the causes of death throughout a community.

To whom came the first glimmer of truth regarding the causes and prevention of this scourge of maternity? Was it some Mantegazza, bending with delight over his crucified vic-

tims? Was it a Goltz, watching agony mingled with maternal love? To none of these came the truth. It was to a young man who, in 1847, was an assistant in the Lying-in Hospital at Vienna, that medical science owes not only the first teaching of the real facts, but, as Lusk puts it, "a large part of what is now the current doctrine concerning the nature and prevention of puerperal fever."* Because Semmelweis pointed out that the awful scourge was due, not to an "inscrutable and mysterious Providence," but to the carelessness of physicians and their ignorance of the necessity of surgical cleanliness, his discovery was received with ridicule; he was hated and despised in his lifetime, and he died, Lusk tells us, "with no other reward than the scorn of his contemporaries." To-day justice is rendered to his name; and although he did not see the whole truth, although experimentation, acting upon his theory, has broadened our knowledge in many directions, it was primarily to his observations in hospitals, and not to any researches in the laboratory, that the beginnings of all we know regarding the methods of prevention were first brought to light.

Nor is it yet scientifically true that puerperal fever is "infrequent," if we test infrequency not by individual experience or by the records of this or that hospital, but by the mortality of an entire nation. When one considers the terrible mortality which prevailed in the large lying-in hospitals, up even to a quarter of a century ago, it would be impossible that the recognition of the value of surgical cleanliness should not make evident its influence in lessening the disease. In Bellevue Hospital, New York, for example, the rate of mortality from this disease in relation to confinements was, in 1872, more than *one hundred times as high* as that which prevailed during the same year through-

* Lusk's Science and Art of Midwifery, pp. 653, 654.

out England and Wales.* The fact that such awful mortality as this has been decreased gives no warrant for the claim that the disease is now infrequent. What has been the experience of England before and since the discoveries to which the Association of American Physicians makes allusion?

During thirteen years, from 1860 to 1873, in England and Wales the death rate of puerperal fever to each 10,000 births varied annually from 13 to 20, only once reaching the highest figure. This was during the period long before any knowledge of antisepsis. Coming to our own time, we find that from 1883 to 1896, inclusive, when methods pertaining to antiseptics were in full sway, there was but one year in which the mortality rate from this cause was as low as 20—the highest rate during the earlier period. The rate for 1893 was twice as high as during any of the eight years, 1860-1863 and 1866-1869, and with but one exception, higher than any time in thirty years. Even in 1896, the mortality from puerperal fever was actually higher than at any time during the period 1860-1873—a quarter of a century ago! Let us compare four years of English experience.†

England.	1877.	1878.	1892.	1893.
Total births	888,200	891,906	897,957	914,542
Deaths from puerperal fever	1,444	1,415	2,356	3,023
Rate of mortality to each 10,000 births	*16*	*16*	*26*	*33*

*Lusk tells us that "in the year 1872 puerperal fever destroyed 28 women of 156 who were confined in the Bellevue Hospital" (p. 692), or 18 per hundred of the women confined! It was only 17 per 10,000 births in England, the same year, 1872.

†All English statistics quoted in this paper have been extracted directly from the reports of the Registrar-General of births, marriages, and deaths. None have been copied from other authorities.

To check any possible source of error, let us compare the foregoing facts with the statistics of London for the same four years.

London.	1877.	1878.	1892.	1893.
Total births	128,092	129,765	132,328	133,062
Deaths from puerperal fever	221	195	347	394
Mortality rate per 10,000 births	***17***	***15***	***26***	***30***

These statistics are peculiarly interesting and valuable. Do they support in the slightest degree the assertion of the Association of American Physicians—made without a word of proof—that the occurrence of puerperal fever has been "rendered infrequent?" Are they not, on the contrary, absolutely contradictory of that claim? Almost a double death rate in a great nation and a great city, and yet the assertion of infrequency? What, we may well ask, is the use of a scientific association,—what is the value of its testimony, if, when scientific facts are so easily accessible, it can not tell us the truth?

2. Have recent experiments "made it possible to prevent the development of hydrophobia after the bite of a rabid animal?"

Taking all the facts into consideration, there is reason to believe that in some cases a certain degree of real immunity is produced, although the evidence is by no means sufficient to release one from the duty of doubt. The failures are very many; and the whole treatment is little more than an immense experiment upon the human race, the results of which are yet to be summed up. But what has this to do with the bill before Congress? All such experimentation as that of Pasteur is permitted by the proposed measure. And how few of us remember the almost infinite rarity of hydro-

phobia as a cause of death compared with other causes of mortality. Take an instance: in England and Wales during the year 1896, and again during 1897, the deaths reported by the Registrar-General as due to vaccination were six times as many as those due to hydrophobia!*

3. We are told that experiments "have furnished an efficacious method of cure of the otherwise incurable disease, myxœdema." Possibly this is true. But the disease is of such exceeding rarity that it is not even described in any but the most recent medical works, and there is nothing in the bill before Congress that would have prevented the alleged discovery.

4. And finally it is said that experimentation has led up to the antitoxin treatment, which has "greatly lessened the fatality of diphtheria."

If it took centuries of experience to determine the uselessness of the lancet and of other methods of treatment so generally in vogue but a little time ago, it is not easy to perceive how the value of this new method of treatment can be absolutely determined until, after many years' trial, it shall be seen that the actual mortality from this disease has steadily decreased during a number of years in each country where it is tried. All statistics based upon the number of "cases" concerning an alleged remedy in which there is a commercial interest, should be viewed, at least, with suspended judgment. Says Dr. Herman of Brooklyn: "Until antitoxin brings down the diphtheria death-rate to a point

* At the hearing before the Senate Committee at Washington, Feb. 21, 1900, Dr. Mary Putnam Jacobi seemed to think that this statement of infrequency was hardly accurate. At the close of her remarks, the Chairman, Senator Gallinger, inquired of her how long she has been engaged in the practice of medicine? "Since 1872," was the answer. "And in that period, (nearly thirty years) how many cases of hydrophobia have you met with?" "*Why, I haven't seen any*," was Mrs. Jacobi's reply. The Chair made no comment.

lower than it ever was before and keeps it at that point in every place, it must be considered a failure."*

Now, no fact is more certain than that antitoxin has failed to meet this test. In Boston, in Baltimore, in St. Louis, in Philadelphia,—as Dr. Herman points out,—there were years before the introduction of antitoxin during which the mortality-rate, based upon population, was lower than during other years since its use. In St. Petersburg, the deaths were 378 in 1893, and in 1897, after antitoxin was introduced, the deaths from diphtheria rose to 1,905. The antitoxin treatment in England, so far from lessening the mortality of the disease, has been wholly unable to prevent its vast increase. During five years (1877-1881, inclusive) when antitoxin was wholly unknown, the deaths from diphtheria to each million population of England and Wales were 111, 140, 120, 109, and 121, or an average, roughly, of about 120 per year. How was it after the introduction of antitoxin? The corresponding mortality for 1895 became 260, for 1896 it rose to 292, and in 1897 it was 246—more than double the mortality of certain years when antitoxin was unknown. The Registrar-General, calling attention to the subject, says that with only two exceptions "the death-rate referred to diphtheria alone *in 1896 was higher than in any previous year since 1861.*" Even if we take the death-rates of diphtheria and croup together, the mortality of 1896, the Registrar-General tells us, has been exceeded only seven times in thirty-three years. Let us glance for a moment at the actual number of deaths from diphtheria and croup in London during two years in which antitoxin has been in use (1895-96), and contrast the mortality they exhibit with that which prevailed only a few years ago, when it was entirely unknown.

*The failure of Antitoxin in the Treatment of Diphtheria," by J. Edward Herman, M.D., p. 5. See MEDICAL RECORD, May 27, 1899.

London, England.—Deaths from diphtheria and croup, in periods of two years, before and after the introduction of antitoxin.

	1890.	1891.	1895.	1896.
Deaths from Diphtheria	1,382	1,433	2,350	2,664
Deaths from Croup	505	339	135	136
Death-rate from Diphtheria, per 1,000,000 population	***331***	***340***	***535***	***599***

During the three years 1895, 1896 and 1897, when antitoxin was in use, the death-rate from diphtheria per million population in the city of London was more than three times as high as that which prevailed during seventeen years from 1865 to 1881, inclusive. In figures like these taken from Government reports, where is the conclusive evidence of that vastly lessened fatality produced by antitoxin, which the ASSOCIATION OF AMERICAN PHYSICIANS has claimed? Even granting that claim, the fact would have no pertinency as an objection to the bill before Congress, which distinctly permits all the experimentation by which antitoxin was discovered. Not a single discovery of any value to humanity, coming from any physiological or pathological laboratory anywhere in the world, during the past quarter of a century, would have been prevented by the legislation that is asked for the District of Columbia. Do the interests of scientific advancement require the suppression of this truth?

In one sense that is the question to-day. All these exaggerations of utility, these petty evasions, these cunning tricks of equivocation and suppressions of the truth,—can we possibly regard them as an honor of science? Could any more saddening disillusion come to those who love learning and who yet cherish faith in the honor of their fellow men, than the conviction that scientists are given to paltering with veracity; and that whenever personal interests are touched, their word cannot be believed?

There is a sphere of activity, no doubt, where honor is unknown. But above that lower world of fraud and pretense, there must be a region of purer and diviner air, where higher ideals are cherished, where truth is held sacred, where falsehood is supremely scorned. If men of science as a class have apparently been far too trustful of their vivisecting brethren, too willing and eager to vouch for their statements, it may be well that they learn by experience the necessity—even here—for scientific doubt. Perhaps the time is ripe for some new expression of the scientific creed. We are quite sure that the great body of scientific workers would therein protest as leading articles of faith, that Science, rightly understood, means only the simple truth; that intentional deception is always a dishonor; and that the sacred cause of learning can never be permanently advanced by exaggeration or deceit.

*THE VALUE OF LIFE AND TRUTH.**

One of the greatest blessings which the scientific spirit of the last hundred years has conferred upon the human race seems to be a vivid appreciation of the value of accuracy. To be exact and precise in the statement of a fact, or the description of an event; to keep one's self from exaggeration and misstatement; to tell the truth as it is—and not as we wish it were—that is the first lesson of a scientific man. Science has lifted precision from the realm of fancy to that of the commonplace; she could have no existence were it not for this keen desire to state facts as they are; she demands truth from her servitors, and if she sometimes excuses a blunder, she never pardons a lie.

It seems to me that the author of a very remarkable paper which appeared in *The Independent* last December, entitled "The Relative Value of Life and Learning," has still somewhat to learn in this art of being accurate. He has certainly fallen into some most grave errors, and, at the same time, given utterance to most astounding doctrines. "How puerile," he exclaims, "is the ultimatum of the Humane Society on vivisection published in *The Independent* a few weeks ago," quoting, at the same time, what purports to be the "ultimatum" itself. Well, in the first place, there is no such sentence to be found in the report of the American Humane Association; I speak with some little confidence, for I wrote the report myself. The Humane Association has issued no such "ultimatum." What Professor Slosson has quoted as such, is a sentence which appears to have been taken from one of four widely varying statements

* From the New York Independent, January 23, 1896.

of opinion regarding vivisection, sent out for signatures, and which represented, not the views of the Association, but only of those who affixed thereto their names. A "puerile" statement, is it? I am very sorry to have it so decided. For the first name that appears under that sentence, heading a long list of eminent men, is the name of Herbert Spencer.

I venture to question very seriously the substantial accuracy of another assertion of Professor Slosson. Instances of self-immolation on the altar of science, he tells us, are not rare; "on the contrary, they are of daily occurrence." A biologist who wishes to study the life history of a tapeworm, grows one in his own body; a physician ruins his health by experimenting on his own stomach; "a sanitarian drinks sewer water for a month; such are the common events in the scientific world." Really? We are listening to a scientific man who is supposed to weigh his words; are these the expression of clear, exact, scientific truth? "Common events," are they? Of "daily occurrence?" Well, this is either pure scientific truth —or something else; and without characterizing it, I venture to say it is not the first; that it is not a matter either *"common,"* or of *"daily occurrence"* for experimenters to drink sewer water, or to grow tapeworms. If of daily occurrence, suppose one asks for the recorded cases of a single month in 1893 or 1894? No one would deny that rare instances of such foolhardy experimentation may be cited, but they are not common or of daily or even monthly occurrence; I should question whether a dozen instances in a dozen years could be quoted from scientific records.

It is quite as inaccurate to assert that laws restricting experimentation upon animals have "shut out England from participation in the advance of modern medicine and surgery." Probably Sir John Eric Erichsen, one of the most eminent surgeons of Great Britain, and author of a text-

book on surgery, is quite as well acquainted with the operation of these laws as any one in America. In a letter received from him last summer, he says:

"Experiments on living animals are most carefully restricted in this country; the 'Cruelty to Animals Act' provided the most ample guaranties in this respect. I acted as Government Inspector of Experiments on living animals for several years, and I can safely assert that the provisions of the Act were vigorously enforced."

Sir Joseph Fayrer, M.D., the Surgeon-General, ought to be somewhat acquainted with the needs of his profession; and in giving to the American Humane Association his views on vivisection, he approves of the very paragraphs which Professor Slosson denounces as "puerile"! When surgeons like these see no danger to medical science in the laws restricting vivisection in their country, perhaps our tears over their decadence are a little out of place.

Are there any boundaries within which a purely scientific curiosity should be restricted? There is a wide-spread sentiment which distinctly disapproves the search for physiological facts which have no conceivable relation to the treatment of human ailments, whenever such investigation implies the torment of animals. Suppose, however, that we admit that research may be unrestrained; shall Science be content with the lower forms of life? Granting that the highest aim of pure science is the pursuit of truth for truth's sake, and that the agony of inferior organizations may ever subserve this end, why should we hesitate to make use of human beings in these researches? "Is a life for a line too dear a price to pay for additions to our knowledge?" "The aim of Science," says Professor Slosson, "is the advancement of human knowledge *at any sacrifice of human life.*" "If cats and guinea-pigs can be put to any higher use than to advance science, we do not know what it is. We do not know of any higher use *we can put a man to.*" *"A human life is nothing compared with a new fact."* Well, I think

the world is under obligations to any scientist who proclaims that creed so openly; it has been long enough cherished in secret; but never was it more openly proclaimed. This is the doctrine held by Dr. Bargigli, who, having purchased from unnatural parents the privilege of experimenting on their children, inoculated these little ones with matter from a leprous tumor, that he might see whether he could thus infect them with an incurable disease. Such is the doctrine held by certain pathologists of France and Germany, who in hospitals have been experimenting upon patients to see whether cancers could not be grafted upon them.* Nor are these the worst instances of the practical application of that theory which Professor Slosson enunciates, that the aim of science is not "the cure of disease or the saving of human life," but "the advancement of human knowledge at any sacrifice of human life." Not very long ago there appeared in one of the leading medical periodicals of the United States an article by an American physician,—a graduate, by the way, from a college rather renowned for its extreme vivisection,—giving a long and detailed account of certain "experiments" he had made while in charge of a "Free Dispensary." A number of little children, twenty in all, were deliberately inoculated with the most horrible disease that afflicts the human race to-day, without the slightest thought of benefit to his victims, and *solely as an experiment.* They were already suffering from one incurable disorder, and the object of the investigation was to see whether, with another, and even worse disease, they might not be infected and poisoned. I shall not quote the full account of his experiment, because, unless this statement is questioned, I do not care to expose him, and a few words must suffice:

* For an account of these experiments in cancer grafting, see *British Medical Journal*, August 29, 1891, and the *Medical Press*, of December 5, 1888, p. 583.

"On November 14, 1883, I inoculated with virus six . . . girls under twelve years of age. On December 14, *I repeated the experiment.* . . . The last time I inoculated fourteen; no result followed in any of the twenty experiments. For the suggestion of *this experiment*, I am indebted to my friend, Dr. Pontoppidan, of Copenhagen."*

Did he prove his theory to be correct? Not at all. "While the twenty cases . . . are not absolutely conclusive, still it is a point worth consideration." The result, then, of these twenty "experiments" upon little outcast girls is merely a point worth consideration! I agree heartily with that conclusion; it *is* worth our most serious consideration.

For myself, there are no words in the English language sufficiently strong to phrase my abhorrence of such human vivisections, and the doctrine upon which they rest; and I believe this abhorrence is shared by the vast majority of the men and women in the medical profession to-day. Before a man can begin experiments like these upon innocent and unsuspecting children, there must be a kind of atrophy of the moral sense. Noble, indeed, is that spirit which inspires men to risk health, comfort, life itself, for the good of humanity; but it is *self*-sacrifice,—not the sacrifice of others, it is recognition of the intrinsic value and sacredness of human life,—no matter how poor or wretched—which underlies religion and morality alike.

There is a story told of Passerot, a French scholar of the last century, which has present application. In his last days, dying of a mortal disease, he was brought unrecognized into the Charity Hospital of Paris—a city, then as now, celebrated for pitiless devotion to scientific curiosity. As the attending surgeon looked down upon the miserable being, he bethought him, perhaps, that "a human life is nothing as compared with a new fact in science," and speaking to his associates in Latin—the language used by learned men—

*New York *Medical Record*, September 10, 1892.

he remarked: *"Fiat experimentum in corpore vili."* At these words, the eyes of the dying man slowly opened; and then, to the physicians' unbounded astonishment, in the same language they had used to conceal intent, came from one they had taken to be a beggar, a scholar's reply: *"Corpus non vile est, domini doctissimi, pro quo Christus ipse non dedignatus est mori!"* And not even yet, in our own day, is the world ready to make the attainment of a new fact in science, superior to the teaching of religion, or the precepts of morality.

THE REGULATION OF VIVISECTION:

AN ADDRESS BEFORE THE SENATE COMMITTEE AT WASHINGTON, D. C.*

Mr. Chairman and Gentlemen of the Committee: It is now about twenty-eight years, since,—touched by the protest of a man whom I greatly revered and one who has addressed you to-day,—I came to question the rightfulness of unlimited vivisection. As I look backward, it seems to me that there was no phase of experimentation then in vogue that I was not eager to practice, either as an aid to memory or for the instruction of pupils; and, filled with the confident enthusiasm of youth, I had believed that nothing in vivisection could be wrong that a man of science might approve. From that day to this, I have thought much and both written and spoken somewhat on this question, but never a word against vivisection in and of itself; never without conceding its utility and rightfulness in certain directions. A believer in vivisection, I know that the practice has been abused, and it is solely against the abuses that have pertained to it, against practices that overstep the boundaries of humanity, that I have protested for the last twenty years.

I have been greatly interested, and by no means without giving a considerable degree of assent, in listening to the arguments of those who have opposed the legislation which we seek. It has almost seemed to me that the majority of the speakers could never have read the bill. As I listened to that eminent surgeon who opened the discussion,

*Address made at Washington, D. C., Feb. 21, 1900, at the Hearing before the Senate Committee on the District of Columbia, on the "Bill for the further prevention of Cruelty to Animals." Revised.

who told us of the advantage which vivisection had been to that art wherein he has attained such success, or to those other medical gentlemen who have dilated upon the gains to medical science through animal experimentation, I have said to myself, "Why, we agree with you; but what has that to do with the bill?" All the researches upon which these discoveries depend are permitted by this measure. This is not a bill for the abolition of vivisection, but for the prevention of its abuses.

Mr. Chairman, I do not think that the bill has been opposed in quite the proper way. A short time ago I took up a copy of *The Journal of the American Medical Association.* Permit me to read from the leading editorial in the issue of December 23, 1899.

To the members of the Medical Profession in the United States:

The cause of humanity and of scientific progress is seriously menaced. Senator Gallinger has again introduced into Congress the bill for the "Further prevention of cruelty to animals in the District of Columbia," which he has so strenuously and misguidedly advocated in the last two Congresses. It is Senate bill No. 34. Twice the Committee on the District of Columbia has, also unfortunately and misguidedly, reported the bill with a favorable consideration. It is speciously drawn to seem as if it were intended only in the interest of prevention of cruelty to animals, but the real object is twofold: 1, *to prohibit vivisection* and, 2, to aid the passage of similar bills in all the State legislatures.

It hardly needs to be pointed out that this would seriously interfere with or even absolutely stop the experimental work of the Bureau of Animal Industry and the three medical departments of the Government—the Army, the Navy, and the Marine-Hospital Service. The animals themselves might well cry out to be saved from their friends. . . .

As my attention has been called officially to the introduction of the bill, I take the opportunity of appealing to the entire profession of the country to exert itself to the utmost to defeat this most cruel and inhuman effort to promote human and animal misery and death and to restrict scientific research. It is of the utmost importance that *every physician* who shall read this appeal shall *imme-*

diately communicate especially with the Senators from his State; shall also invoke the aid of the Representatives from his or other districts in his State, and by vigorous personal efforts shall aid in defeating the bill.

It is especially requested, also, that all of the national, State, and county societies, at their next meeting, take action looking toward the same end. If regular meetings are not soon to be held, special meetings should be called. Correspondence is invited from all those who can give any aid. . . . Petitions should be addressed to the Senate of the United States.

W. W. KEEN, M.D.,
President American Medical Association.

It seems to me, Mr. Chairman, that the author of that editorial took upon himself a very grave responsibility. He was addressing the whole medical profession in this country, a body of over a hundred thousand men; and he was inflaming their minds against this bill—one which the vast majority of them would never have occasion to read—as a measure, the object of which was "to prohibit vivisection." He appeals to them to write letters to Senators, to hold meetings of medical societies, to pass resolutions of protest against this measure. I believe one speaker (Dr. Hare) has referred to these letters and these resolutions, and that he put the question to this committee whether "you have not received protests from all parts of the country against this bill?" Why of course you have received protests! This editorial explains why. In the medical society to which I belong, in one of the largest cities in the country, the matter was brought up, and a resolution passed and ordered sent to you—in condemnation of this bill—the object of which the members were told, was "*to prohibit vivisection in the District of Columbia!*"

Let us examine the assertion that this bill "prohibits vivisection." Take experiments in bacteriology. They constitute, Dr. Woodward says, "nearly all the vivisection done in this District." Now, where are they prohibited?

Inoculation experiments are specifically mentioned as allowed without the administration of anæsthetics. Take experiments pertaining to surgical operations, such as those instanced by Dr. Morris, of New York, in a recent letter to this committee. Suppose this bill became a law, and that some surgeon desired to make experiments of that kind. What would be his course of action?

Well, in the first place, he would be obliged to obtain a license permitting him to perform vivisection. A reputable man would have no difficulty about this. I know that it has been said that nothing—that no law should stand in the way of anyone desiring to make experiments; some of the men who have to-day addressed you, have declared in writing, that legislation defining who may, or may not perform experiments, would be "offensive in the highest degree." Well, Sir, we differ with that view. In his essay on "Nature," John Stuart Mill affirms that there are persons "who have a real pleasure in inflicting or seeing the infliction of pain. It is not merely absence of pity; . . . it is a positive thing." Now we hold that in the interest of society, in the interest of humanity, in their own interest, the practice of vivisection should be forbidden absolutely to individuals of such depraved and degenerate minds. And in this opinion, we trust that we are not alone. In one of his works, Dr. George M. Gould, the present editor of *The Philadelphia Medical Journal,* and one of the leading medical writers of the country says:

"If a very limited use of vivisection experiment is necessary for scientific and medical progress, it must be regulated by law, carried out with jealous guarding against excess and against suffering, and the maimed animals painlessly killed when the experiment is complete. *The practice carried on by conceited jackanapes to prove over and over again already ascertained results, to minister to egotism,* for didactic purposes—these are not necessary, and must be forbidden."

Who are the "conceited jackanapes" of the medical profession? Here we are told that they not only exist, but that they are performing experiments which "are not necessary and must be forbidden." We believe therefore, that the restriction of the privilege of vivisection to proper persons will not injure the interests of science. We assert that the man whose heart burns with the ferocity of Nero or the lust of Tiberius ought by the law to be forbidden to enter the laboratory for vivisection.* But these are exceptional cases.

*"There is a class of men who, in the interest of humanity, should never be allowed to touch an animal for purposes of vivisection, or even to be present when a vivisection is going on. When Dr. George M. Gould, one of the leading medical writers in America to-day, is forced to admit that there are men now practicing vivisection in this country who are a *'disgrace both to science and humanity;'* when Dr. Theophilus Parvin, of Jefferson Medical College, declared, in the presidential address before the American Academy of Medicine, at Washington, D. C., May, 1891, that there are American vivisectors who 'seem, seeking *useless* knowledge, to be blind to the writhing agony and deaf to the cry of pain of their victims, *and who have been guilty of the most damnable cruelties,'* I think, sir, that they indicate a class of men who should never be permitted to torture animals for such vile purposes and such ignoble ends.

I but touch the shadow of an awful mystery when I say that one of the most horrible forms of mental and sexual perversion is displayed in the torture of animals and human beings; that a recent writer, Dr. Krafft-Ebing, of the University of Vienna, declares that there are 'numerous cases' of beings in human form who 'care only for the sight of suffering' and who *'make use of the sight of dying animals or torture animals to stimulate their lust;'* and regarding the land where vivisection is no more free than it is to-day in the District of Columbia the charge has publicly been made: *'En France, on prolonge les vivisections pour se procurer d'infames plaisirs.'* I do not need to hold this abomination into any clearer light; every intelligent physician over forty years of age is perfectly aware of it. And when associations of American vivisectors 'protest' against the right of Congress to declare who may and who may not experiment on living animals in the District of Columbia, they simply denote a willingness to sacrifice the welfare of society to the freedom of vivisection. Outside the ranks of the clique to which these men belong, I do not believe there are many in the medical profession in this country, who would not affirm that those who find pleasure in torture should never be permitted to satisfy their depravity under the guise of scientific investigation. To prevent them is one of the objects of this bill."

—Letter to Senator McMillan, Jan. 17, 1900, Report, p. 162.

Does any one say that such restriction of the practice to proper persons means prohibition?

In the next place, the bill provides for the registration of the places where vivisection is to be carried on, and for the inspection of the laboratories by duly appointed Government officials. Where is there any "prohibition of vivisection" in that requirement? At the hearing on this bill in April, 1896, the Surgeon-General stated:

> "I would say that the laboratories of the Surgeon-General's department are open to inspection. If any reputable person in this city desires to visit our laboratory to see what is done there, he would not be refused. There is nothing to be concealed."

Now, I take it, this is fairly meant. I shall not assume that "any reputable person," accepting this invitation, must send previous notice, so that all to which criticism might be offered can be hidden away before he comes. Not at all. The Surgeon-General means, we infer, precisely what he says. Very well; where, then, is the hardship of official inspection? Does anyone have the audacity to say that official inspection, such as this bill provides, will "prohibit vivisection," and yet declare that *all the laboratories are open to any reputable person in this city?* The absurdity of this must be manifest to you all. Add to the above restrictions the clauses providing for reports, for the use of anæsthetics, and for the utility of the experiments to be permitted, and you have the bill. I respectfully submit, therefore, that the charge that this bill would "prohibit vivisection" is absolutely false.

Mr. Chairman, I have never said that this was a perfect bill. We are open to suggestions for its improvement from any quarter. Speaking to-day to one of the gentlemen who have appeared before you in opposition, I told him that I had no doubt of our ability to come to an agreement with the other side, provided they would concede the principle

of Government supervision. "What are you afraid of?" I asked him. "Why, it is that clause about inspection," he replied; "we are afraid that it will be so used as to prevent scientific experiments of any kind." Well, has it had that effect in England? Not long ago, I received a letter from a gentleman whose eminence as a surgeon will be recognized by all of the medical gentlemen present; I refer to Sir John Eric Erichsen, F.R.S. It is a statement of his views on the subject of vivisection, and his sentiments are my own. He says:

"Experiments on living animals are absolutely necessary for the advancement of medical surgery and biological science. Such experiments *should not be allowed without proper restrictions* as a safeguard against their abuse by incompetent persons, or their being performed for futile purposes. Such experiments should only be performed for purposes of utility—that is, the advancement of scientific knowledge—and not for the purpose of acquiring manual dexterity; nor should they be allowed as class demonstrations or for needless repetition. All experiments on living animals, if painful, should be performed under an anæsthetic.

Experiments on living animals are most carefully restricted in this country. . . . I acted as Government inspector of living animals for several years, and I can safely assert that the provisions of the act were vigorously enforced, and never, to my knowledge, contravened."

"Vigorously enforced!" Against whom? Why, against those who would break the law. There is here no complaint or criticism. I have heard it said: "Why, no physician could be induced to act as inspector of laboratories if this bill becomes a law." Well, here is a medical man, an English surgeon of the highest distinction, who acted as Government inspector for several years; and he had not a word to say against the law.

Another objection raised is that legislation is unnecessary. "Only properly conducted scientific experiments under proper authority are now allowed," says the Secretary of

Agriculture. Certainly, that is the law. It was Cardinal Newman, I think, who declared that in any discussion it was first necessary "to define your terms;" and that, assuredly, is necessary here. What are "properly conducted experiments," and who are the "proper authorities?" The proper authority is the man in charge of the vivisection laboratory or at the head of the department under which vivisection is conducted. What is a "properly conducted experiment?" Why, any experiment which any scientific investigator may wish to perform, is it not? Does some student of physiology desire to repeat those atrocious experiments of Mantegazza, who tested the extent to which animals might endure torture, who invented a machine which he appropriately called his "tormentor," with which, he says, "I can take an ear, a paw, or a piece of skin of the animal, and by turning the handle squeeze it beneath the teeth of the pincers; I can lift the animal by the suffering part; I can tear it or crush it in all sorts of ways." Is this other than a "properly conducted scientific experiment?"

It is said that Mantegazza has long contemplated a visit to this country. Is there a man here who will say regarding this distinguished physiologist, "I would not permit him to make his experiments in my laboratory, because he can not do them properly?"

[Dr. SALMON. What are the courts for?]

Who is to bring them before the courts? Is Mantegazza to report them himself? Are they to be reported by the head of the laboratory who gives him permission for their performance? Do you expect that any medical student witnessing them would dare to denounce them to the courts? Any conceivable experiment may be performed, notwithstanding the present law, provided only that permission be given by the man at the head of the laboratory.

It is claimed that legislation is unnecessary, because in the District of Columbia no painful experiments are per-

formed. For instance, a memorial against this bill, presented by the Medical and Scientific societies of Washington, in 1896, quoted a passage from a letter of Surgeon-General Sternberg, which, these scientific societies affirmed, "applied as well to other Government laboratories in Washington in which biological research work is conducted." This quotation is a most remarkable one. Anyone reading it would naturally take it to mean that no painful experiments were performed in this District of Columbia, and that, therefore, there was not the slightest occasion for any concern. The quotation is as follows:

"The experiments which have been conducted at the Army Medical Museum since I have been Surgeon-General of the Army, and, so far as I am informed, previous to that time, relate principally to the cause and prevention of infectious diseases, and to the results of diseased processes (pathology)."

And then follow in italics these remarkable words, to which I invite your special attention:

"These experiments do not call for any painful dissections, but consist in the subcutaneous inoculation of cultures of various pathogenic bacteria, etc."

That paragraph is italicized in the memorial of these Scientific societies; it appears with emphasis. What, sir, was the object of that emphasis? Was it not to carry the implication that painful experimentation did not exist in the District of Columbia? Is there any other object for these italics? Instead of answering this argument myself, let me simply quote from the address, delivered last August at the *British Medical Association,* by George Wilson, M.D., LL.D., the president of the section on State Medicine. Speaking on preventive medicine, Dr. Wilson (who is one of the leading authorities on that subject in Great Britain) said in regard to this "inoculation of cultures," which "do not call for any painful dissections":

"I boldly say there should be some pause in these ruthless lines of experimentation. . . . I have not allied myself to the anti-vivisectionists, but *I accuse my profession of misleading the public* as to the cruelties and horrors which are perpetrated on animal life. When it is stated that the actual pain involved in these experiments is commonly of the most trifling description, *there is a suppression of the truth of the most palpable kind,* which could only be accounted for at the time by ignorance of the actual facts. I admit that in the mere operation of injecting a virus, whether cultivated or not, there may be little or no pain, but the cruelty does not lie in the operation itself, which is permitted to be performed without anæsthetics, but in the after-affects. Whether so-called toxins are injected under the skin, into the peritoneum, into the cranium, under the dura mater, into the pleural cavity, into the veins, eyes, or other organs—and all these methods are ruthlessly practiced—*there is long-drawn-out agony.* The animal so innocently operated on may have to live days, weeks, or months, with no anæsthetic to assuage its sufferings and nothing but death to relieve."

It strikes me as rather a remarkable incident, when the president of a section in the British Medical Association accuses his professional brethren of "suppression of the truth!" I fancy that his statement will not be denied, and that on closer questioning we should find that a little painful experimentation is going on even in this District of Columbia. And I call attention to one singular fact. All these experiments in pathology,—which certainly would be objected to by antivivisectionists,—are permitted by this very bill, which its opponents have denounced from Maine to Texas as "*prohibiting vivisection!*"

Mr. Chairman, it seems to me a significant circumstance that in all the criticism which has been made by the opponents of this measure not a single suggestion has come from any quarter looking to its improvement in any particular. That signifies a great deal. It means that all this verbal criticism of details is meaningless; that *no improvement would make it acceptable to those men who demand absolute and unrestricted freedom to do exactly as they like in the vivisection of animals.*

This is the line of division between our position and that of those who are active in opposition to this bill. We say that Congress should absolutely forbid the performance of wanton, useless, and cruel experimentation. "No," say the advocates of free and unrestricted vivisection, "let there be no restrictions except such as we ourselves may see fit to impose upon our own action." "Unnecessary and offensive in the highest degree would it be by any system of official inspection, . . . or by legislation of any kind, . . . to attempt to dictate or control how, and by whom, and for what purposes, and under what conditions . . . experiments shall be made."* That is the position of those who oppose the bill. Four of the gentlemen who have spoken here to-day have affixed their signatures to that sentiment, and it is one, I do not hesitate to say, that throws wide open the door to every form of cruelty that may be done under the excuse of "scientific research."

Should experiments like those of Mantegazza be forbidden here in Washington? "By no means," is practically the response of our opponents. "As to whether, under given circumstances of research or teaching, an experiment involving pain should be performed, is a matter *which should rest with the responsible expert by whom or under whose direction the thing would be done.*" This opens the door to Mantegazza; it permits everything that this "responsible expert" may see fit to do; and this statement is signed by Dr. Sternberg, Dr. Salmon, and Dr. Welch, who have spoken here to-day.

Now, this view of the irresponsibility of science to the ordinary obligations of humanity—this theory of scientific Anarchy—we must oppose. We oppose it in behalf of that ideal of humaneness which lies at the foundation of all those great reforms which distinguish the nineteenth century above those which preceded it; which abolished the slave-

*Senate Doc., Report 1049, p. 135.

trade; which emancipated the negro and forbade the traffic in human souls; which took women and children out of the coal-mines and forbade their employment at dangerous trades; which has made cruelty a crime. We must oppose it in behalf of those weak and ill-regulated beings whose first impulses to crime may be due to habitual indulgence in unlimited vivisection.

You say, perhaps, that such cases never occur. Not long ago I stood in Mt. Auburn, by a nameless and almost forgotten grave. It was the last resting-place of a man of science; one who had been revered and honored in his profession. And yet that man had lured to his laboratory a brother physician, had stabbed him to the heart, and had suffered the penalty of murder. As I stood by that dishonored grave, I said to the old man who had pointed it out to me, "Did you know him?" "Yes," said he, "I knew him." "Well, do you not think that, after all, his confession might have been true—that the deed was done in sudden anger, and that he had not lured his old friend to his laboratory for the purpose of committing a murder? "No," said the old man, "I think that he did it." "But why?" I asked. "Any man," said he, "that would take a living dog and nail him to a board, and cut him up alive, would be capable of committing murder—and that is what he did." (Applause.) That is the sentiment of the people. It is more than a sentiment; it is a truth.

And finally in the name of Science herself, we oppose this theory that vivisection should be above the law. Before you, here, are men distinguished as scientific workers, and yet a century hence, with some possible exception, everyone here will be forgotten by posterity as completely as if he had never lived. But in my hand I hold a statement of belief concerning vivisection to which is affixed a name that will be linked to the history of science as long as science herself shall endure. Let me read it:

VIVISECTION RESTRICTED BY UTILITY.

"Vivisection is a practice of such variety and complexity that, like warfare between nations, one can neither condemn it nor approve it unless some careful distinctions be first laid down. We hold that only a great and definite advantage to the interests of humanity can justify its use, and that in each case, science must prove that advantage and that necessity; its hands should not be left free to inflict torture without restriction or restraint. Even the zeal of a Magendie or a Mantegazza can not condone their cruelty, nor can science make the search for a fact obliterate the distinctions between right and wrong. Within certain limitations we regard vivisection to be so justified by utility as to be legitimate, expedient, and right. Beyond these boundaries it is cruel, monstrous, and wrong.

Experimentation upon living animals we consider justifiable when employed to determine the action of new remedies; for tests of suspected poisons; for the study of new methods of surgical procedure, or in the search for the causation of disease—in short, for any object where the probable benefit to mankind is very great, and the suffering inflicted not greater than that of instantaneous death nor more than the pain and distress of human ailments, to alleviate which the experiment is made. On the other hand, we regard as cruel and wrong the infliction of torment upon animals in the search for physiological facts which have no conceivable relation to the treatment of human diseases, or experiments that seem to be made only for the purpose of gratifying a heartless curiosity—such, for example, as those described in the work of Professor Mantegazza, entitled "The effect of pain upon respiration."

We consider as wholly unjustifiable the practice of subjecting animals to torture in the laboratory or classroom, merely for the purpose of demonstrating well-known and accepted facts. We hold that the infliction of torment upon living animals under such circumstances is not justified by necessity, nor is it a fitting exhibition for the contemplation of youth. And since in England, Scotland, and Ireland such experiments as these are regarded as degrading in tendency, and are therefore forbidden by law, we think no harm will come to science if they shall also be forbidden in every American State.

We believe, therefore, that the common interests of humanity and science demand that vivisection, like the study of human anatomy in the dissecting room, should be brought under the direct supervision and control of the State. The practice, whether in

public or in private, should be restricted by law to certain definite objects, and surrounded by every possible safeguard against license or abuse."

That, Sir, is my platform regarding vivisection. We have been told to-day by one of the advocates of free and unrestricted vivisection that he holds us and our principles in scorn. Well, we shall endeavor to bear up under the obloquy of his disdain, for our principles are those I have just read, and at the foot of this sheet of paper is the signature of the author of the theory of evolution—the greatest living exponent of modern science—Herbert Spencer, of England. (Applause.)

In the name of that ideal of science which Herbert Spencer represents, in the name of those whom the State should protect, in the name of humanity, we ask, not for the abolition of vivisection, not for restriction against useful and humane research, not for any impediment to the progress of medicine, but simply for such legislation as shall make vivisection subject to the law, prevent its abuses, and stamp its cruelty as a crime.

*SOME LESSONS OF GREAT REFORMS.**

For what will posterity,—looking backward from the vantage of five hundred years hence,—hold in chief remembrance the wonderful Nineteenth Century in whose closing hours we are living to-day? We need hardly to be reminded that in material progress, in great and useful discoveries and inventions, this age has contributed more than all the centuries which have preceded it, from the dawn of civilization, down to a hundred years ago. And yet, I venture to doubt whether our material progress will so greatly impress the future historian of our times, as the fact that only during the Nineteenth Century has the ideal of humaneness as a practical principle of morality found expression in human laws.

Nearly fifty years ago, Macaulay, contrasting the England of the past with the England of his own time, declared that there is—

"scarcely a page of the history or lighter literature of the seventeenth century which does not contain some proof that our ancestors were less humane than their posterity. Masters, well born and bred, were in the habit of beating their servants. Pedagogues knew no way of imparting knowledge other than by beating their pupils. Husbands, of decent station, were not ashamed to beat their wives. The implacability of hostile factions was such as we hardly can conceive. Whigs were disposed to murmur because Stafford was suffered to die without seeing his bowels burned before his face. . . . As little mercy was shown by the populace to sufferers of an humbler rank. If an offender was put into the pillory, it was well if he escaped with his life from the shower of brick-bats and paving stones. If he was tied to the cart's tail, the crowd pressed round him, imploring the hangman to

* Address delivered at the Meeting of the AMERICAN HUMANE ASSOCIATION, at Pittsburgh, Pa., October 12, 1900.

give it him well, and make him howl. Gentlemen arranged parties of pleasure to Bridewell on court days, for the purpose of seeing the wretched women who beat hemp there, whipped. A man pressed to death for refusing to plead, a woman burned for coining, excited less sympathy than is now felt for a galled horse or an overdriven ox. . . . The prisons were hells on earth, seminaries of every crime and disease. At the Assizes, the lean and yellow culprits brought with them from their cells an atmosphere of stench and pestilence which sometimes avenged them signally on bench, bar, and jury. *But on all this misery, society looked with profound indifference.* Nowhere could be found that sensitive and restless compassion which has, in our time, extended a powerful protection to the factory child, to the Hindoo widow, to the negro slave; which pries into the stores and watercasks of every emigrant ship, which winces at every lash laid on the back of a drunken soldier, which will not suffer the thief in the hulks to be ill-fed or over-worked, and which has repeatedly endeavored to save the life even of the murderer." *

But that which appalls the student of history is not only the ferocious brutality of the seventeenth century, as pictured by Macaulay; it is the seeming utter indifference to suffering which characterized all classes of society down to little more than a hundred years ago. Crime was punished with a savage atrocity out of all proportion to the heinousness of the offence. In no Christian land was human life then so cheap as in England; during twenty-two years (1749–1771), in the city of London alone, no less than 606 persons of both sexes met death on the scaffold in the presence of the rabble, for offences which are not capital to-day; the poor woman who stole a bit of cloth valued at five shillings to buy food for her starving children, was sent to the gallows without compunction, for the benefit of the London shopkeeper, and as an example to others who might be tempted to steal. In 1773, John Howard, a country gentleman of England, journeyed through his native land, visiting its prisons and jails, and discovering in them a state of misery and cruelty

* History of England, Chap. III.

surpassing belief. The jailors were generally without pay, except such as they were able to extort from the wretched victims within their power. Stagnant sewers festered beneath cells, and fever claimed scores of victims every year. Prison windows were found blocked up, because at that time, sunlight was taxed to furnish the revenue for England's wars. Some jails were the property of ecclesiastics. When the prison of Ely became insecure from age, the jailor adopted the expedient of chaining his prisoners on their backs to the floor,—their necks in iron collars,—so that the proprietor of the prison, the Bishop of Ely, might be spared the expense of repairs; and by no persuasion could Howard induce the bishop to make a change. Another dungeon belonging to the Bishop of Durham, had but one little window; and here Howard found six wretched prisoners chained to the floor. "In that situation they had been for many weeks; they were very sickly; the straw on the floor was worn to dust." In Plymouth, Howard found a dungeon, the door of which had not been opened for five weeks; and in this living tomb, so low that one could not stand erect, without fresh air, and without light, were three human beings. In another "horrid dungeon," as Howard calls it, entered only by a trap-door, he found a woman, who, with a child at her breast, had been sentenced to confinement in that place a year before. The child had died. It must be remembered that imprisonment, at this period, was the penalty of minor offences only; for hundreds were sent to the gallows, who are to-day sent to the workhouse or the jail. Yet the revelations of Howard seem to have excited only a throb of indignation that was soon forgotten; and the abuses he exposed, lasted far into the present century.

The condition of the insane in England at the beginning of this century was equally shocking. Almost anybody, for instance, could get a license to keep "a mad-house,"— as

asylums were significantly called. The lunatic was treated as in a hopeless condition, beyond the possibility of recovery, to whom the only duty of Society was effectual restraint. In 1814, a report was issued by the British Parliament, giving results of a government inquiry regarding the "State of Mad-houses in Great Britain." During the investigation, it was found that ignorant and ferocious keepers had been accustomed to indulge in almost every species of cruelty, insult and neglect. Sometimes exposed in cages like wild beasts, and excited to rage for the amusement of visitors; more often loaded with chains, and kept in solitude and darkness, their beds but a little straw; half frozen in winter time, and half naked at all times; treated with a brutality beyond expression, and from which there was no possibility of redress,—that was the lot of the lunatic of England almost within the memory of living men. Some cells were on the bare earth; some were supplied with clean straw but once a week. At Bethlehem Hospital of London, women were found naked, chained to the wall by an arm or a leg; and among them one was discovered, perfectly quiet and composed, and bitterly sensible of her surroundings. Were all these chains and fetters necessary? The highest scientific authorities of that day, men of the longest experience in the treatment of insanity, sanctioned their use. Dr. Thomas Monroe, physician-in-chief to Bethlehem Hospital of London for over thirty years, testified before the Parliamentary Committee that "in a hospital for the insane, *there is no possibility of having servants enough to watch a great number of patients without the use of irons.*" No man in England at that time seemed better qualified to express a scientific opinion on the treatment of lunatics. Well, there it is. Of what value is it? Enter to-day, any great asylum of America or Europe, and you will find, in the present treatment of insanity, how utterly worthless may be the judgment of a scientific man,—even with thirty years

experience,—when he attempts to justify a cruelty, or seeks to perpetuate and uphold an abuse.

It was in 1828, that a young man, whose name, from that time, during more than half a century, was associated with nearly every great philanthropic movement of the age, —became one of the commissioners in lunacy with authority to inspect the condition of the insane. He visited asylums and retreats in various parts of England and personally observed the abuses that existed. He saw for himself the custom of chaining lunatics to their beds, and leaving them in that situation, from Saturday afternoon until Monday morning, with only bread and water within their reach; he saw the violent and the peaceable, the clean and the filthy shut up together in dark and disgusting cells; he saw for himself all the horrible customs then pertaining to the care and treatment of the insane. But the fact that astonished him more than anything else,—the mystery of every reform, —was this: *that the great mass of people knew nothing and cared nothing about these cruelties;* and it was only with the greatest difficulty that he could obtain from any outside source the slightest information, or expression of opinion. So horrified was he with the misery and cruelty thus revealed, that he vowed he would never cease pleading the cause of those helpless victims of man's cruelty, until abuses should cease by legal enactment; and the Earl of Shaftesbury kept his vow.

History, it is said, is merely philosophy teaching by example. What lessons of caution and encouragement may we gather by the study of abuses and of great reforms? We, too, are contending for the wider acceptance of humanitarian ideals, and their application to existing evils. Against us are marshalled the same forces of cruelty and indifference; the same selfish interests; the same ignorant reliance upon the statements of men, who, by all means possible, are endeavoring to uphold the systematized abuses by which they

live. Their opinions confront us; their authority is cited against us. But what weight will their judgment have on that day when reform is accomplished? What value should be ascribed to their opinions to-day? Let us glance somewhat in detail at the history of one or two of the great humanitarian movements of the past, noting not only the infamy of the abuse, but the greater infamy of its defense; pointing out how the most hideous cruelties have been shielded and upheld, and great wrongs excused and defended,—in the past as they are to-day,—by well-meaning but misguided men; wrongs which despite the support of respectability and the advocacy of selfish interests, fell at last before the outraged conscience of humanity and passed away forever.

It may be doubted whether in human history, there has ever existed a more hideous form of injustice, or a more shameful blot upon civilization than was the African Slave trade of a century and a quarter ago. Beginning (so far as England is concerned), by Sir John Hawkins in 1562, it lasted during two and a half centuries of English history without hindrance or restraint. No pen can picture, and no tongue describe the agony endured in a single slave-ship out of the thousands that, during three centuries, brought Africa to our shores. "So much misery condensed in so little room," said Wilberforce, "the imagination never conceived." The vessels as a rule were from 80 to 200 tons burden, and some of them were even smaller than this. Proceeding from Liverpool or Bristol, from Boston, Providence or Newport, with a cargo of rum, a few trinkets and bundles of cloth, the master of the slave-ship came to anchor off the coast of Guinea, and began to bargain for his cargo of human beings. One by one they were brought to him in canoes, sometimes at night; and no questions as to rightful ownership ever prevented acceptance, or hindered trade. Villages, a hundred miles inland, were attacked at

night, without regard to cost of life, in order that the young and vigorous might be captured, and sold to the Christian traders in human flesh and blood. The slaves when brought on board were at once ironed and taken below. Here, on a deck sometimes but four feet high, where it was impossible to stand erect, they were packed so closely, that at night, they could not even turn from side to side; "they had not so much room," said a witness before the Parliamentary Committee, *"as a man has in his coffin."** When the ship was filled, then began the two months' voyage known as the Middle Passage. Under a tropical sky, in fetid air so horrible that the odour of a slave-ship could be recognized for miles at sea; in quarters so poorly ventilated, that some slaves died of suffocation nearly every night, and were found when morning came, shackled, the living to the dead; half starved; suffering often terribly from loathsome disease; tortured without mercy if in agony they resisted or protested in any way; sometimes with bones protruding from the skin, from lying in fetters upon the bare planks;† dying so fast that often a quarter of their number perished before the shores of America were reached; so enfeebled by their torments that another large number died soon after reaching land; and in many cases, deliberately worked to death after their arrival,—this was the fate of thousands of human beings at the hands of Christian men, under the sanction of Christian society, less than two centuries ago!

What awful tragedies lie buried in the forgotten secrets of that trade! What cruelties were enacted in mid-ocean, by the side of which the atrocities of war and piracy seem almost to fade into insignificance! Sometimes, in their

* Evidence of Surgeon Falconbridge before Parliamentary Committee, 1790.

† Surgeon Falconbridge testified that even the sick had nothing but bare planks to lie upon.

despair, the slaves sought refuge in suicide; and cases were reported where,—having sprung overboard,—they smiled back at their tormentors as though they would cry: "We have escaped you at last!" On one voyage, a young woman, torn from her family, refused to eat or to speak. Every attempt was made by the captain of the slave ship to break her will; thumb-screws, capable of causing exquisite agony, were applied; she was suspended in the rigging and there flogged and tormented, but all to no effect; in three or four days she was dead. After the lacerated body had been thrown to the sharks, some of the slave-women told the surgeon that she had spoken the night before she died. "What did she say?" was his inquiry. "She said that she was going to her friends," was their answer. Perchance there came to that tortured victim the vision of a promise to be fulfilled.*

On another voyage, a child less than a year old, having refused to eat rice mixed with palm oil, a Captain Marshall flogged it himself; ordered its feet put into hot water, with so little care that they were scalded, and the skin came off; and again and again during four days tortured it in the sight of its mother, till at last the child was dead. Calling its mother forward, Capt. Marshall ordered her to fling overboard the body of her babe. She refused. He cruelly flogged her, until at last, she took up the dead child; went with it to the side of the ship, and, turning her head so that she need not see its body swallowed up by the sea, let it sink beneath the waves, and then "wept for hours."

Now and then a sick child wailed so much at night that it annoyed the captain,—and it was torn from the mother's breast and flung overboard to the sharks. On one occasion some slaves made a little noise at night, disturbing the captain's slumbers; and in punishment, he ordered up eight

* Evidence of George Millar.

or ten; tied them up in the rigging and flogged them with a scourge of wire; clapped on the thumb-screws, and left them to writhe in torment while he went back to sleep. "I have seen," said the witness, "the ends of their thumbs mortified, from having been thumb-screwed so violently," and some of them died.*

In 1783, a Capt. Collinwood of the slave-ship "Zong" with many sick slaves on board, found himself, after a long journey near the coast of America. If the negroes should die on board the ship, the owners of them would have to bear the loss; if on the other hand, under pressure of circumstances, the captain cast the cargo overboard, then the loss, provided he had sufficient excuse, would by English law, fall upon the underwriters. On the plea that he was short of water, Capt. Collinwood threw alive into the sea 132 of his slaves, and on returning to England, demanded payment for their loss! The insurers naturally refused; but the law was plain, and the courts actually compelled them to pay for the murdered slaves.

These are incidents of that traffic, of which Wilberforce said: "If the wretchedness of any *one* of the many hundred negroes stowed in each ship could be brought before his view, and remain within the sight of the African merchant, —*whose heart could bear it?* Never was there a system so big with wickedness and cruelty."† "Even if the objects of this traffic," said Charles Fox, "were brute animals, no humane person could expose them to be treated with such wanton cruelty. This nation will not long permit the constant commission of crimes that shock human nature, for the sake of the West Indies." "Why ought the slave-trade to be abolished?" thundered William Pitt; *"Because it is incurable injustice."* It was, he declared, "the greatest practical evil that ever has afflicted the human race; the

* Testimony of Henry Ellison.

† Speech in House of Commons, May 13, 1789.

severest and most extensive calamity recorded in the history of the world."*

How insignificant seem sometimes the beginnings of a great reform! In 1785, the University of Cambridge offered a prize for the best essay on the academic question "whether it be allowable to hold human beings in slavery?" A young man, Thomas Clarkson, decides to compete for the prize; and among the scanty literature of description and protest, he finds a book, written by Anthony Benezet, an obscure Quaker of Pennsylvania, and published in Philadelphia in 1771. Its revelations excite his horror; he studies the question yet more completely; and finally determines to devote his life to that agitation for abolition which lasted over twenty years. Then, to the soul of a woman came the thought that popular agitation is not sufficient; that before any effective work can be done, the question must come up before the British Parliament; a member of the House of Commons, a young man not yet thirty years old, consents to bring up the question in debate; and so William Wilberforce makes the abolition of the Slave-trade and the cause of the oppressed the work of his life. In 1788, a Committee was appointed to take evidence; and so, gradually, the whole infamous traffic was brought to the light of day.

More than one man who had been engaged in the slave-trade testified to enormities of which he had been aware. How familiar to all of us are the hymns of John Newton: *"One there is above all others," "Amazing grace! how sweet the sound," "Safely through another week," "How sweet the name of Jesus sounds,"* and others found in every modern collection. Yet it was the author of these hymns, then a venerable clergyman nearly seventy years of age, who told the Parliamentary committee of what he had seen forty years before, when he had been captain of a slave-ship, and had landed cargoes of negroes on our shores.

* Speech in House of Commons, April 2, 1792.

"Unlimited power," says Newton, "when the heart by long familiarity with the suffering of slaves is become callous and insensible to the pleadings of humanity, *is terrible.* I have seen them sentenced to unmerciful whippings, until the poor creatures had not power enough to groan. I have seen them agonizing for hours,—I believe for days,—under the torture of the thumb-screws." He stated that often he had heard a captain boast, that after repressing an attempt of his cargo of slaves to escape, "he studied with no small attention how to make the death of the leaders as excruciating as possible." Four times did Newton cross the Atlantic in command of a slave-ship. Of his cargo about one-fourth were children; and in selling them upon their arrival in South Carolina or the West Indies, the idea of keeping children with their parents "was never even thought of; they were separated as sheep and lambs are separated by the butcher."*

Against personal testimony of eye-witnesses to its cruelty, how did those who were pecuniarily interested in maintaining the slave-trade manage to prevent all legal interference for nearly twenty years? How may an infamy be defended? We wonder sometimes what words of apology could possibly be uttered in support of so atrocious a system of cruelty. Yet the task is not difficult. It was done precisely as it is done to-day, in the matter of vivisection. The American Humane Association has asked,—not that animal vivisection be abolished, but simply that it shall be placed under such Government supervision as may prevent wanton cruel-

* In addition to his testimony before the Parliamentary Committee, Rev. Mr. Newton, in 1788, published a little book: "*Thoughts upon the African Slave-Trade*," in which he gave a relation of his experiences. He says: "I hope it will always be a subject of humiliating reflection to me that I was once an active instrument in a business at which my heart now shudders." For a transcript of personal experience, read his hymns beginning: "In evil, long I took delight," and "Amazing grace."

ties and abuse. Our proposals are met by the same methods which were adopted a century ago in regard to the slave-trade,—by a denial of cruelty and by evasion of the truth; by claim of necessity, and by favorable testimony of eminent men in support of the system. Let us note the character of the evidence which was brought forward in support of the slave-trade.

Mr. John Fountain, called upon to testify before a Parliamentary Committee, June 15th, 1789, stated that he had lived on the African coast for eleven years, and had never even heard of such a thing as kidnapping a slave! On several occasions he had made trips to the West Indies on slave-ships, and he declared that the negroes were treated "exceedingly well indeed." He had mingled with them on the main deck, and found them "perfectly satisfied, and at all times very cheerful,"—just as the late Harold Frederick, describing in the *New York Times* his visit to Horsley's laboratory, declared that he found the animals, "all fat, cheerful, and jolly; the cats apparently unconcerned as to their brain-loss; *and the monkeys quite unaffected by the removal of a spinal cord!*"* Another witness testified that on slave ships, "the song and dance were promoted,"—neglecting to explain that by "singing," he meant the wailing of the slaves; and that by "dancing," he referred to the custom of bringing the negroes on deck, once or twice a day, and forcing them by the lash, to jump up and down in their chains. Other witnesses declared that "the abolition of the slave-trade would be an act of cruelty to the negro himself." "The total abolition of the trade by all nations," testified Mr. Fountain, "would produce a scene of carnage from one end of the African coast to the other." "The abolition of the slave-trade," said another witness, "would be the ruin of the colonies, destructive to the slaves already in them; and be the most impolitic act, *the greatest inhu-*

* London correspondence of *New York Times*, October 30, 1892.

manity and breach of faith which this country could ever pass,"* an absurd statement equalled only by that of Dr. William W. Keen, who gravely declared that the Senate bill for the supervision of vivisection in the District of Columbia was "a most cruel and inhuman effort to promote human and animal misery," and a serious menace to *"the cause of humanity!"*†

Of course there was the usual appeal to selfish interests. If the slave-trade were abolished in England, it would simply be carried on by the Americans with whom of late years it had "particularly increased." Admiral Hotham declared that "the African slave-trade is a nursery for British seamen; without doubt, it is important to keep it up." Commodore Gardner said: "I consider that if the slave-trade is abolished, *there is an end to the colonies!*" Sir John Dalling, formerly governor of Jamaica, declared that if the slave-trade were abolished, "by degrees, it would be the ruin of every proprietor, and produce beggary to his descendants; and by degrees also, I am afraid,—commercially speaking,—bankruptcy in this country." Mr. Jenkinson, a member of Parliament, asserted that "the cause of Humanity is against abolition."‡ Another member of Parliament admitted that it was "an unamiable trade," but he "would not gratify his humanity at the expense of the interests of his country; and we should not too curiously inquire into the unpleasant circumstances by which it was attended." Lord Rodney, Vice Admiral of England, declared that the abolition of the slave-trade "would greatly add to the naval power of France, and diminish that of Great Britain in proportion." Admiral Sir Peter Parker gave it as his opinion that the abolition of the slave-trade "must, in time, destroy nearly

* Testimony of Alex. Campbell, Esq.

† See editorial in *Journal of the American Medical Association*, Dec. 23, 1899.

‡ Speech, House of Commons, April 2, 1792.

half our commerce, and take away from Great Britain all pretention of being the first Maritime Power in the world,"* —just as Dr. Kober of Washington told the United States Senate, that a bill bringing the practice of vivisection under the inspection of the United States Government "would be simply one step, and that an important one,—in the direction of dealing a death-blow to the progress of American medicine!"† Col. Tarleton, in sneering tones with which we are all familiar, referred in the House of Commons to "that philanthropy which the abolitionists fallaciously esteem to be *their* vantage ground,"—precisely as President Eliot of Harvard University, with equal accuracy and good taste, asserted that the advocates of anti-vivisection laws "consider themselves more humane and merciful than their opponents."‡ "By abolition," continued Col. Tarleton, "several hundred ships, several thousand sailors, *and some millions of industrious mechanics* will lose their employment, and be rendered worse than useless. If I were an enemy to the constitution of England, I would vote for the abolition of the African slave-trade!"

How singular all this seems to us to-day! The slave-trade was abolished eighty years ago. Did "carnage from one end of the African coast to the other" ensue? Did England then fall from her position as a great maritime power, and did France step into her place? Did several "millions" of mechanics find themselves without employment and worse than useless? Was half the commerce of England destroyed? May it not be more than probable that when posterity shall look back upon those who to-day oppose any reform to the abuses of vivisection, they will regard their opposition with the same contempt with which we esteem all this evidence for the slave-trade, given a hundred years ago?

But the strongest argument advanced in favor of slavery

* Testimony, March 29, 1790.

† Hearing on Vivisection, Feb. 1900, p. 111. ‡ Do. p. 219.

or the slave-trade was that which is so familiar to us regarding vivisection,—the denial of any abuse. England desired to know the condition of the slaves in the West Indies. Were they deliberately worked to death under the lash, and their places supplied by new arrivals? That assertion had been made. Never is it difficult to obtain evidence in support of cruelty when selfish interests are concerned; and slavery in the West Indies was defended by some of the most distinguished men of the time, with the same emphasis and eagerness evinced in our day by illustrious personages in defence of the practice of unrestricted vivisection. Witness after witness, summoned before the Parliamentary Committee, testified that the condition of the negro in the West Indies was far superior to that of the laboring poor upon English soil. Gilbert Franklyn of Antigua, West Indies, declared that the lot of the negro slave "is to be envied by the poor of all countries I have seen." Sir Ashton Warner Byam, the Attorney-General for Granada, said: "The condition of slaves who are industrious is comfortable and happy, and they appear perfectly contented with their lot. . . . A negro slave in general has fewer wants unsatisfied, and enjoys more of the comforts of life than the English laborer." Mr. John Castles, a surgeon and slave-owner who had resided in the West Indies for over twenty years, declared that compared with the condition of the laboring poor in England, the negro slave was "much more comfortable;" and that he had an occasion to remark this fact in a journey which he had just taken through England and Scotland. Mr. Robert Thomas, who had resided in the West Indies for nine years, comparing the condition of the common laborers and poor people in England with those of the slaves, emphatically declared that "the slaves have a decided superiority with respect to every comfort of life." Dr. Samuel Athill, of the Island of Antigua, said: "I think the situation of the negro and his

family is much more free from cares, miseries and mortifications than that of the peasant in many parts of this country."

But even higher testimony was sought; and the commanders of great fleets and navies which had made the West Indies the base of their operations, were summoned to give evidence. "What has your Lordship observed of the behaviour of masters toward their negro slaves in those islands where you have commanded?" was asked of Lord Admiral Shuldham. "It has been mild, gentle and indulgent in all respects; equal to what masters generally show to their servants in this Kingdom." The negroes, Admiral Shuldham said, "in general, appear perfectly satisfied. I can remember when I was a midshipman that I envied their condition, *and often wished to be in the same situation!*"* The Honorable Admiral Barrington being asked the same question, declared that the slaves were treated with "always the greatest humanity;" that when rather disconsolate himself,—"I have seen them so happy that *I wished myself a negro!*"† Vice-Admiral Arbuthnot had "never observed the smallest cruelty toward slaves." Rear-Admiral Hotham had known the West Indies ever since boyhood; had noticed that the treatment of slaves was generally "mild and humane; very much so;" and he declared that "slaves were always very well satisfied with their condition, and very cheerful." Sir Ralph Payne, formerly Governor of the Leeward Islands, averred that he never saw a slave, "the severity of whose labour was by any means comparable with that of the day-labourer in England." Admiral Sir Peter Parker declared that "from the best observation I could make, their treatment was mild, lenient and humane; I never heard of even one instance of severity toward a slave; they not only appeared to me to be properly fed, clothed and lodged, but were in my opinion in a more comfortable situation than the

* Evidence given March 23, 1790, p. 404.

† Evidence of March 23, 1790, p. 405.

lower class of any people in Europe, *Great Britain not excepted.*"* And finally Lord Rodney, the Vice-Admiral of England, who had resided in Jamaica over three years, never saw any instance of cruelty, and asserted that slaves "at Jamaica appeared to be much better fed than the common laboring people here."†

How curious all this testimony seems to us to-day! How shameful, you say, how infamous it was for men standing so high in the esteem of England, to stoop to cast the weight of their national reputation in favor of slavery and the slave-trade! Infamous, does one call it? That is too harsh a term even for so great a blunder. Wherein do these old warriors differ from the men of high position and national repute, who, in our time and country have not hesitated to cast the glamour of their names over the practice of vivisection carried on to any possible extent, without legal restriction or restraint? In imagination, we see these bronzed and scarred heroes of England's navy, giving their evidence regarding cruelties which they had "never seen," and which therefore they were certain did not exist; Admirals Shuldham and Barrington ridiculously declaring that the lot of the negro slave in the West Indies was so full of exuberant felicity and content as to excite their envy; Hotham affirming the slaves to be "always very well satisfied with their condition;" Arbuthnot stating that he never observed "the smallest cruelty,"—why are these opinions a whit more shameful or absurd than posterity will regard those of the chemists, geologists and astronomers of the National Academy of Sciences who declared without a dissenting voice (and with no better opportunities for judgment), that "the suffering incident to biological investigations *is trifling in amount!*"‡ Does it seem almost like a play, the strange folly

* Evidence of March 29, 1790, p. 479.

† Evidence of March 29, 1790, p. 468.

‡ Senate Report No. 1049 (Fifty-fourth Congress), p. 128.

of it all? There, in fancy, we see the two chief commanders of England's navy, Admiral Sir Peter Parker, and Lord Rodney, Vice-Admiral of England, each bending under the weight of many years spent in his country's defense; each hastening to put himself on record for all time to come, as a defender of the greatest infamy the world had ever known, —the "incurable injustice" of slavery and the slave-trade! Well, side by side with this picture of Sir Peter Parker, impartial history may one day paint that of President Eliot of Harvard University, writing a committee of the American Senate to the effect that a scientific vivisector must needs be the supreme and only judge of his own actions, since "the Government *cannot* provide any board of officials competent to testify to (his) fitness;" protesting against "all such legislation;" allowing that vivisection should not be permitted "before College classes for purpose of demonstration only,"—evidently ignorant that it is *so* used in the University over which he presides.* There stands my Lord Rodney; and by his lordship's honored name, posterity may place that of the Right Reverend William Lawrence, Bishop of Massachusetts, hastening from Cambridge to Washington to help impede passage of a bill,— not for the abolition of vivisection,—but simply for the restriction of its abuses; vouching for the humanity of his vivisecting friends as my Lord Rodney vouched for the humanity of the slave-masters of Jamaica; and making charges, for the support of which,—when their accuracy was challenged,—he had not a particle of proof!† The dust of the old Admirals moulders beneath their marble tombs under the dome of St. Paul's Cathedral; men remember

* Hearing before Senate Committee on the District of Columbia, Feb. 21, 1900, on Bill for the further Prevention of Cruelty to Animals, page 219.

† Same, p. 34. For correspondence here referred to, see "*Journal of Zoöphily*," Sept. 1900.

what they did for England, and forgive them their mistakes. Perchance a century hence, when humane ideas are realized in law and custom as they are not to-day, History in its review of our generation, will find occasion for the same strange contrast of noble character with dishonoring advocacy; the same opportunity for forgiveness; the same pity and regret.

I do not propose to tell the story of that long struggle; it was an agitation that in the British Parliament lasted nearly twenty years. Hopeless, indeed, it must have seemed that moral ideas, based upon unselfish principles, could ever prevail against the opposition of cruelty and greed. Year after year, in the British Parliament, Wilberforce brought forward his resolution for the abolition of the Slave-trade, only to have it meet repeated defeat. Sneers at his philanthropy became the fashionable jest; the Duke of Clarence in the House of Lords denounced him by name as a fanatic and hypocrite; even George the Third, in some moment of lucidity, whispered one day in his ear: "How go your black clients, Mr. Wilberforce?" Judging from the strength of the forces in opposition, the public indifference, the long delays, the scorn and contempt so freely outpoured, even friends of the movement could not but fear at times that he would never succeed. From his death-bed, John Wesley wrote to Wilberforce, in probably the last letter which ever came from his pen: "Unless Divine Power has raised you up to be an *Athanasius contra mundum,* I do not see how you can go through with your glorious enterprise, in opposing that execrable villainy which is the scandal of religion, of England, and of human nature. Unless God has raised you up for this very thing, you will be worn out by the opposition of men and devils; but if God be for you, who can be against you?" Triumph at last came to the cause for which he had so faithfully labored. In 1807, Parliament abolished the slave-trade, and made it illegal

after the following year. In 1811, it was made a felony; in 1820, it was made piracy, and punishable with death. Where now in the world's esteem are they who testified that to the maintenance of the power of England, it was necessary to keep up that sum of all villainies,—that curse of mankind? Where in the world's esteem a century hence, will be the opinions of those, who in our day are not ashamed to assert that for the maintenance of Medical Science and the benefit of mankind, it is necessary to permit vivisection to be absolutely without limitation or control?

Let us glance now at the history of another of the great humanitarian movements of this century; the agitation which led to the reform of factories and coal-mines in Great Britain. The horrors pertaining to them at the beginning of the century we can but faintly conceive; indeed, in some respects they probably surpassed in enormity even the abominations of slavery. Child-labor had become profitable; and the horrible custom grew up in England, of sending pauper children from agricultural districts, to be literally worked to death in the factories of the North. Packed in wagons like calves or sheep, they went unconsciously to their doom. I wish there were time to dwell somewhat upon the conditions, which even then,—and for many years afterwards,—prevailed in English factories where boys and girls were employed. One of the worst abuses revealed by Parliamentary inquiry, was the brutality of overseers exhibited toward the little children, who, from utter weariness and lack of sleep, were physically unable to perform their tasks. Living thus in a state of constant apprehension and acute suffering; beginning work at five o'clock in the morning and ending after seven at night; steeped in ignorance and want; dwarfed alike in soul and body; without the slightest redress from cruelty, without hope of escape from their slavery; dying long before their time,—human sacrifices to avarice,—this was the condi-

tion of the child-slaves of England less than sixty years ago. Then it was that, writing to Lord Ashley, the poet laureate Robert Southey declared: "I do not believe that anything more inhuman has ever disgraced human nature in any age. Was I not right in saying that Moloch is a more merciful fiend than Mammon? Death in the arms of the Carthaginian idol was mercy to the slow waste of life in the factories!" Then from the heart of another English poet came that indignant cry of sympathy and anguish:

"Do you hear the children weeping, O my brothers,
Ere the sorrow comes with years?
They are weeping in the playtime of the others,
In the country of the free.

They know the grief of man without his wisdom;
They sink in man's despair, without his calm;
Are slaves, without the liberty in Christendom;
Are martyrs by the pang without the palm.

They look up with pale and sunken faces,
And their look is dread to see;
"How long," they say, "how long, O cruel nation,
Will you stand,—to move the world,—on a child's heart;
Stifle down with a mailed heel its palpitation,
And tread onward to your throne amid the mart?
Our blood splashes upward, O gold-heaper,
And your purple shows your path;
But the child's sob in the darkness curses deeper
Than the strong man in his wrath."*

"Ah," you say, "who had the heart to withstand this bitter cry of the children? Who could object to making their working time in the factories but ten hours a day?" Well, among those who made reform impossible for twenty years were some of the noblest and best men in England;

*I have given only a few detached sentences from Mrs. Browning's pathetic poem.

men such as Richard Cobden and John Bright and John Arthur Roebuck, to whom in no small degree, the English people owe the abolition of the Corn laws, the vote by ballot and Parliamentary Reform. Cobden and Bright stood for peace when nearly all England was clamoring for war; they were the firm friends of freedom in those dark days of our civil war, when official England was almost ready to recognize the southern confederacy; yet neither Cobden nor Bright could be made to see that anything in the factory system demanded parliamentary interference. They were not alone in their blindness; Gladstone, whose long after-life was in so many ways devoted to humanity, opposed the ten-hour bill for women and children; O'Connell, who knew well the wrongs of Ireland, could see none needing redress in the factories of Lancashire; the venerable Lord Brougham, zealous as he had been for popular education, for Catholic Emancipation, for suppression of the Slave trade, the abolition of slavery, and other reforms, —nevertheless spoke strongly in the House of Lords as late as 1847, against the bill for factory reform. Sometimes we marvel how great and good men of our own time can be so blind to the cruelties of unregulated vivisection as to oppose the slightest measure of State supervision. But nothing that Harvard's president has ever said against the legal regulation of scientific experimentation upon living animals can begin to equal, in either bitterness or emphasis, the speeches made by Cobden and Bright against factory reform. They lived to see the principle of State supervision regarding labor carried to an extent that even its friends had not dreamed possible; so that dangerous machinery had to be fenced; so that children and young people were forbidden to clean it while in motion; so that their hours of labor were not merely limited, but fixed by law; so that their continuous employment was forbidden to exceed a certain number of hours;—they lived to see all this, and

to see England greater, and happier and more prosperous than ever before.

There came a time, after reform was accomplished, that one man had the rare courage to confess his mistake. In 1860, Mr. Roebuck arose in the House of Commons and acknowledged that he had been wrong in his opposition to factory reform, but declared that it had been based on the statements of the millowners of Lancashire. "They declared," said Mr. Roebuck, "that it was the last half-hour of work performed by their operatives, which made all their profits; and that if we took away that last half-hour, we should ruin the manufacturers of England. I listened to that statement,—and trembled for the manufacturers of England! Parliament passed the bill. From that time down, the factories of England have been under State control, and I appeal to this House whether the manufacturers of England have suffered by this legislation?"* When the physiological laboratories of America shall have been for ten years under State control, perhaps we may have a like confession, from some who now are "trembling" for the science of medicine!

In a letter to the Earl of Shaftesbury,—whose efforts for reform he had so long and so violently opposed,—Mr. Roebuck referred to the influences by which he had been so grievously misled:

"The present state of these poor women and children is a serious lesson to all legislators. It teaches us in a way not to be mistaken, that we ought never to trust to the justice and humanity of masses of men whose interests are furthered by injustice and cruelty. The slaveowners in America, the manufacturer in England, though they may be individually good men, will nevertheless, as slaveowners and masters, *be guilty of atrocities at which Humanity shudders; and will, before the world, with unblushing faces, defend cruelties from which they would recoil with horror, if their moral judgments were not perverted by their self-interest.*"

* *London Times*, March 22, 1860.

There is the secret of the opposition to reform! Whether on the deck of the slave-ship, or in the dungeons of the madhouse and the jail, in the factories of Lancashire or in the private laboratory of the physiologist,—cruelty is ever the offspring of unlimited and irresponsible power, and ever able to summon to her defence those who "would recoil with horror, if their moral judgments were not perverted by their self-interest."

Another phase of the same great humanitarian movement, was that relating to the coal-mines of England. The conditions pertaining to them previous to the present century, we can never know. Now and then we find the record of some awful explosion, some terrible loss of life; but only the great accidents were reported; and every day, human beings, young and old, were drowned, suffocated or crushed, and no record made. It was not until 1833, that some of the real facts concerning coal-mining began to be generally known, although full comprehension of the truth did not come for several years. What was the condition of affairs here discovered when the light of inquiry was fairly thrown on?

It was a state of things that one would almost hesitate to believe could exist in a Christian country. In the first place, the coal-mines of Great Britain,—like laboratories for the vivisection of animals,—were entirely free from official inspection of any kind; and within them, anything was possible. Working from twelve to fourteen hours a day; confined in narrow spaces, breathing air mixed with gas and dust, and in heat so great that sometimes the candles would melt; liable at any moment to be crushed or wounded, or imprisoned to die of slow starvation,—these,—the ordinary circumstances of the miners' daily lives,—caused them to become especially subject to disease, deformity and premature death. It was found that children were taken into the mines at a very early age, that the workhouses

of London sent down batches of orphans to be "broken in"; and if the unhappy child survived his treatment till he was nine, he was apprenticed to the miner and forced to serve him until he was twenty-one. Sometimes a small child's task was sitting in pitchy darkness, twelve to fourteen hours a day, and at intervals, opening and shutting a gate; sometimes the little apprentices were forced by their masters to enter places so dangerous, that the miners themselves did not dare to go, till they had tested the extent of the risk, by first sending their little slaves. Some of the passages were less than two feet high; and along these, tiny children were forced to push or drag little wagons laden with coal. With backs bruised and cut by knocking against the roofs of the narrow passages; with feet and legs often covered with ulcers; so hungry, that they were often glad to pick up and devour the tallow candle-ends which the miners had thrown aside; exposed to every kind of fatal accident, and never seeing the sunshine except on Sunday,—this was the fate of child-slaves in England, within the memory of living men!

There were yet even darker shadows. In many parts of England and Scotland it had become the custom to have girls and young women work in the coal-mines, performing every description of labor, from hewing out the coal to dragging it in tubs, and in some places, carrying it on their backs up the rickety ladders to the surface of the ground. Girls, naked to the waist, harnessed with leathern girdles about their hips, hitched to iron chains, and crawling on hands and feet in the darkness of the pit; subjected to every peril; associating with the worst and most degraded men; constantly witnessing blackguardism and debauchery; listening to blasphemy and obscenity; working under these surroundings from long before daylight until long after dark; ruined in body, ruined in mind, and in time bringing bastard children upon the parish;—*this* was the picture

—revealed to Christian England in the nineteenth century,—of the white slavery on British soil!

It was not until 1842, that Lord Ashley,—afterward the Earl of Shaftesbury,—succeeded in bringing the first bill for reform into the British Parliament. He proposed, in the first place, to prohibit the employment of boys before the age of thirteen; to abolish the apprentice system of pauper orphans, and to take women and girls from the coal-pit altogether. Perhaps you will imagine that after revelations which I have ventured only faintly to outline, such a measure would meet with general approval on the part of every rational person? On the contrary, these suggestions of change aroused the most bitter opposition. From whom do you ask? Why, chiefly from the proprietors of the coal-mines,—acting precisely as the proprietors and directors of laboratories for vivisection in this country act in regard to all measures for legal regulation. Owners of collieries in every part of Great Britain poured petitions into Parliament, beseeching the rejection of the bill,—just as Congress has been besieged with similar requests from almost every vivisection laboratory in the United States. Their arguments were precisely those with which we are familiar. In the first place, they asserted that no abuses existed; or, if there were any, they had been vastly exaggerated; just as certain Harvard Professors once referred to printed evidence concerning the abuses of vivisection, as "long lists of atrocities that never existed,"—denying in one sweeping sentence facts as certain as any recorded in history.* It was said that if women and children were taken out of the mines, they would only be driven into the workhouse, or become a public charge. One member of Parliament declared that some seams of coal "could only be worked by women,"—beyond which absurdity could hardly go further. Another member of Parliament insisted that the occupation of a coal-

* Statement in *Boston Transcript*, July 13, 1895.

miner was generally considered "a remarkably pleasant and cheerful employment!" The motives of Lord Shaftesbury and those who urged reform were ascribed to "hypocritical humanity,"—precisely as a leading vivisector in the Agricultural Department at Washington, writing to a public journal of that city, referred in terms of customary courtesy to "the so-called Humane Society," which, he said, *"prates so loudly* about Altruism, morality and ethical principles generally."* Altogether, in the opinion of the owners of coal-mines, any legislation affecting them was as unwise and uncalled-for, as the State supervision of vivisection is regarded by President Eliot and by every vivisector in this country.

But no section of the proposed law aroused such fierce antipathy as the clause providing for the legal and systematic visitation of coal-mines by inspectors appointed by the Government; just as no section of the Bill before the United States Senate for the regulation of vivisection, excites such angry protests as that which opens the doors of the Government laboratories to an inspector appointed by the President of the United States. All such supervision of coal-mines was declared by the owners to be "a useless and mischievous prying into private affairs," precisely as various distinguished vivisectors and their friends have declared that the proposed governmental supervision of vivisection would be *"unnecessary and offensive in the highest degree."*† Speaking in the House of Commons, Lord Radnor insisted upon the principle that "it was not the duty of the State to enforce moral obligations." Lord Brougham, one of the most eminent men in the House of Lords, distinguished alike for his learning, eloquence and philanthropy, declared that this legislation was "mistaken

* Letter of Daniel E. Salmon, D.V.M., in the *Washington Post* of Feb. 4, 1896.

† Report on Vivisection, No. 1049 (54th Congress), p. 185.

humanity";—precisely as those eminent vivisectors, Bowditch and Porter, Stiles and Sternberg and others, refer to the legal regulation of vivisection as "one of the least wise of the agitations which beset modern society." Lord Londonderry went so far in his opposition as to declare that he would say to an inspector, "You may go down into the pit as best you can; and when you are down, you may remain there!" Even Lord Ashley, the promoter of the bill, was inclined to question whether subterranean inspection of coal-mines would be quite safe. Yet, when,—with some modifications,—the bill became a law, not one of the terrible results, so fearfully prophesied, ever came to pass. The coal-mining industry was not ruined. Women and girls, taken from the coal-pits, found other and more decent avocations. Children, no longer forced to be slaves in the darkness of the pit, did not flock to the workhouse, or become beggars on the street. The Government Inspectors went down into the mines and found no one so reckless as to lift a finger against them, or hinder them in the discharge of their duties. The law was obeyed.

It is a significant fact that all subsequent legislation on this subject resulted from evidence made known through that inspection of mines by government officials, which had been so long and so strenuously opposed. For instance, over a thousand lives of coal-miners had been sacrificed in coal-pits every year. "You cannot prevent such accidents as these," cried the owners of the mines; "they are but the mysterious visitations of an inscrutable and All-Wise Providence." "You can lessen them by suitable legislation; for they are largely the result of your carelessness and indifference," was the rejoinder. And when the awakened humanitarian sentiment of England came to realize that only wise legislation was needed to make human life safer in the mines, it was not very long before such laws found their place on the statute book. What was the outcome? Every

law that was passed, tending to make inspection more efficient, and the mine-owners more careful of human life, had the almost immediate effect of decreasing the number of fatal accidents. During ten years (1851–1860), for every million tons of coal raised to the surface, the loss of human lives in the coal-mines of England averaged 14 per year. During the next ten years (1861–1870), the annual sacrifice of human life fell to 11; from 1871 to 1880, it came down to 9; and from 1881 to 1889,—although the mines were continually getting deeper and, in that respect, more dangerous,—the mortality had fallen to only 6 deaths per year, to each million tons of coal raised to the surface. You see it is only necessary to get at the facts through evidence that cannot be disputed,—and the reform of abuse is simply a question of time. This is why government inspection,—whether of factories, coal-pits or laboratories for vivisection—is always so stubbornly resisted: it opens the door for reform. It is a significant fact that from the first bill of 1842 down to the last, of all measures introduced into Parliament providing, by the more thorough inspection of coal-pits, for the greater protection of human life, there was not one,—not one,—which did not encounter the strenuous antipathy of the men who had an interest in the coal-mines, and in concealment of their defects. History repeats itself, and we have no reason for wonder at the opposition that confronts us on this point.

It is because I think that such records of the past are profoundly encouraging to us, that I have brought them again to mind. What can they teach us? Well, in the first place, it seems to me that History inculcates no clearer lesson than the duty of disregard for the eminence of names, when they are put forward in defence of systematized cruelty, or for the hindrance of reform. Men point to some ripe scholar, adorning the presidency of a great institution of learning; to some

ecclesiastic, representing the highest dignity of his church, or to some official at the head of a Government laboratory; and because such men are against us, we are told to cease all agitation for reform. And then History lifts a curtain, and we see Daniel Webster standing in the Senate Chamber on March 7, 1850, advocating the passage of the Fugitive Slave law; we see the venerable Lord Brougham in the British House of Lords, using his vast influence to keep women and children in the coal-mines; we see Cobden and Bright and Gladstone palliating and defending the awful atrocities of the factory system; we see some of the wisest and best men in the American pulpit of fifty years ago, defending the infamy of American slavery. For never was there a great cruelty or abuse that could not enlist the championship of respectability, or bring to its support the influence of illustrious names.

And the next lesson which History teaches us is patience. In that promulgation of humane ideals to which this Association is devoted, progress seems sometimes very slow. We call attention to that cruelty of fashion which demands for feminine adornment the sacrifice of song-birds almost by the million,—and the vast majority of fashion-worshippers pay no heed. We denounce the brutalities incident to cattle-transport, and no great outburst of popular indignation demands their suppression. Year after year, we ask, not that vivisection be abolished, but only that it be placed under the supervision of the State, so that abuses which have repeatedly evoked the condemnation of the most eminent men of science in Europe and America, may be somewhat lessened. It seems as little to ask as the demand, made over fifty years ago, that coal-mines should be made safer, or that hours for child-labor in factories should be reduced; yet the same selfish interests, helped and supported by the complaisance and ignorance of well-meaning men, rise in opposition, and the years of agita-

tion seem almost fruitless of result. But, was it not always so? Never in the world's history was there speedily accomplished the reform of an organized injustice which depended for support upon the selfish interests of mankind. From the day when Anthony Benezet began his agitation against the "incurable injustice" of the slave-trade, till the accursed traffic was made piracy by English laws,—almost half a century rolled by. From the time when John Howard first penetrated the gloomy dungeons of his native land, till its prison system was reformed, more than sixty years passed, and Howard was in his grave. The keepers of private mad-houses in England as fiercely resisted inspection and legal supervision as those who are opposing it to-day; but the light at last penetrated the private dungeon, as one day it will penetrate the private laboratory. Against the inhumanity and greed of the owners of coal-mines, it took long and weary years of agitation to accomplish any appreciable reform. For twenty years, the factory-owners of England were enabled to prevent reduction of the hours of toil for women and children; but the great forces of humanitarian sentiment prevailed at last. Courage and patience,—these are the words for us. Nature takes her time; she will not be hurried; and we too, working faithfully, can wait with confidence for the sunrise of that higher civilization, which is yet to dawn upon a suffering world. Are we in a minority? So once were Wilberforce and Clarkson, Shaftesbury and Howard. There is no slavery more degrading to character than the ignoble fear of standing for truth and justice without the multitude's clamouring approbation and support.

"He's a slave who dare not be
In the right with two or three;
He's a slave who dare not choose
Hatred, slander and abuse,
Rather than in silence shrink
From the truth he needs must think."

In a struggle with the forces of ignorance, cruelty and self-interest, let us not be wanting in that fidelity to truth which was the consolation of Spinoza in his solitude, and which helped Galileo to stand alone; in that hatred of injustice which animates our work; in that devotion to Humanity and humane ideals, which has ever been the inspiration of all conflict with oppression and cruelty; which has ever carried to eventual victory all great reforms.

APPENDIX.

It has fallen to the writer,—perhaps not unnaturally,—to have his views regarding vivisection very generally misunderstood by the medical profession, and not infrequently misinterpreted or misrepresented by writers in the medical press. Of a considerable number of letters, chiefly to medical journals, which such criticisms have made necessary in reply, a few are herewith given, as bearing upon questions at issue. In some instances, slight revisions have been made, where conducive to clearness or brevity.

[*From* Boston Medical and Surgical Journal, *April 11, 1895.*]

A REPLY TO PROF. H. C. WOOD.

Cambridge, Mass., April 6, 1895.

Mr. Editor:—It is not in accord with my ideals of professional honor and veracity, to quote from a printed document a garbled extract, and, omitting all mention of the proofs that immediately follow on the printed page, to boldly denounce it as a "lie." That offence Prof. H. C. Wood has unfortunately permitted himself to commit in the letter which appeared in your issue of this week. I shall not follow his example, and call his untruths by the Saxon word "lies," because falsehood implies deceitful intent,—and Professor Wood is a member of the medical profession, to which I have the honor to belong. It is more probable, I fancy, that, blinded by the white heat of his well-known enthusiasm for that unbounded liberty which led Magendie and Claude Bernard into infamous cruelty, he forgot, in his zeal, that as an apostle of science, his first duty was absolute accuracy and fidelity to fact, and that no skill in the laboratory excuses forgetfulness of the decencies of debate. Still, "it is astounding, that even the wildest fanaticism" should permit a man of his standing to be guilty of perversions so easily detected and so absolutely unfair.

(1) Professor Wood makes no quotation from either of the two circulars issued by the AMERICAN HUMANE ASSOCIATION, though he speaks of their "positive false statements." The slip from which he prints an incomplete extract is simply a letter from the President of the Association, and it formed no part of the general investigation.

(2) *His quotation from this letter was garbled.* "To garble," says Webster, is "to pick out such parts as may serve a purpose," and that is what he did. Permit me first to quote the few words which so unduly inflamed him, and to follow them with that proof of their accuracy which Professor Wood most carefully omitted in his letter to you:

"While State laws generally prohibit cruelty, yet, in the great majority of cases, there is no law, no college rule, or regulation even, preventing the infliction upon living animals of the utmost conceivable torture, *so long as it is done within the walls of the college laboratory and by permission of the instructor.*"

This statement Professor Wood stigmatizes as false. But why did he omit and evade the evidence on which it rested, and which immediately follows?

"The proof of this statement rests upon replies made by different college presidents to letters of inquiry.

"President Harper of the University of Chicago writes: 'We have not thought it wise to place any restriction upon experimentation involving prolonged or severe pain.' President Patton of Princeton said: 'The College of New Jersey has not defined or limited the extent to which living animals may be subjected to pain.' President Dwight of Yale answered: 'We have had no occasion to lay down any definite restrictions as to the matter to which you refer.' President Jordan of Stanford University, going still further, says: 'I am decidedly of the opinion that *no restrictions should be put upon the student,* except those which the professor may lay upon him.' The idea finds wide acceptance that infliction of extreme pain is simply a question for the instructor to decide. 'We have felt that the matter could be safely left *to the discretion of the preceptor,*' says President Rogers of the Northwestern University. President Carter of Williams College states that 'the principle has always been to *trust the professor wholly* unless there seemed reason for distrust.' 'We leave the decision *to the judgment of the investigator,*' says President Day of Syracuse University. These quotations by no means exhaust the list, but they indicate the freedom that now exists."

So far from being false, the *one* statement to which Professor Wood specifically objected is absolutely, accurately true. When he asserts that a college student or instructor "guilty of cruelty," would be amenable to the laws of the land, he fights windmills; for

who has ever doubted it? How does the law of the State affect in any way the bungling experimentation of a student, on the nervous system, by permission of his superior, and in the privacy of the laboratory?

Apparently Professor Wood assumes that I am an anti-vivisectionist. He is wrong. Of the four statements presented by the American Humane Association, I have signed—with slight alterations—the one favorable to vivisection restricted by utility to mankind. What, then, have I opposed for the last fifteen years? *The introduction into America of the foreign ideal of scientific research;* the widening opportunity for abuse. Does one say that at the hands of a learned and expert scientific investigator, "abuse" is impossible? Permit me to quote from a letter received but yesterday from a Massachusetts physician and one of your subscribers:

"When I was studying medicine in Paris, it was the custom of a distinguished physiologist to illustrate his lectures by operations on dogs. Some of these dissections were not very painful, but others were attended with excruciating, long-continued agony; and when the piteous cries of these poor brutes would interrupt his remarks, with a look of suppressed indignation, he would artistically slit their windpipes, and thus prevent their howling! . . . I never noticed the slightest demonstration of sympathy in their behalf, except on the part of a few American students. These dogs were subjected to needless torture, for the mere purpose of illustrating well-known, accepted facts, capable of being taught satisfactorily by drawings, charts and models. . . . I entertain no doubt that barbarous cruelty was practised at that time in all the Parisian physiological laboratories, though it is probable that for novel and horrible experiments, none could rival the infernal ingenuity in this business of that master-demon, Claude Bernard."

Who was this "master-demon?" The most renowned physiologist in Europe; a man honored with prizes by the French Academy, with a public funeral at the cost of the government, and for whose monument subscriptions were asked in England and America! But for one, much as I love scientific truth, I do not believe in methods like these, nor in that secrecy which makes them possible in American laboratories. And when Professor Wood denies that abuses occur in this country, permit me to refer him to the editorial pages of a journal with which he is familiar,—*"The Therapeutic Gazette"* for August, 1880."* "Vivisection is grossly abused in the United

*Professor Wood, in 1895, was the editor of THE THERAPEUTIC GAZETTE.

States. . . . We would add our condemnation of *the ruthless barbarity which is every winter perpetuated in the medical schools of this country.* History records some frightful atrocities perpetrated in the name of religion; but it has remained for the enlightenment and humaneness of this century to stultify themselves by tolerating the abuses of the average physiological laboratory—all conducted in the name of Science."

I am, sir, etc.,

ALBERT LEFFINGWELL, M.D.

[*From* THE MEDICAL NEWS, *December 14, 1895.*]

THE VIVISECTION CONTROVERSY.

To the Editor of The Medical News:

Sir:—As a subscriber to *The Medical News,* I have always found its columns both entertaining and profitable; but I must confess to a little disappointment in your long editorial of November 30th, and its references to myself. I venture, therefore, to ask the courtesy of your columns, less for reply to your criticisms than for explanation of apparent inconsistencies.

It does not seem to me, in the first place, that your summary of my paper concerning the manifesto of the Harvard professors is as fairly set forth as the facts would warrant. Permit me to state them.

On the 13th of last July there appeared in the Boston *Transcript* a long article "Concerning Vivisection," signed by the Assistant Professor of Physiology in Harvard Medical School, and drawn up at the suggestion of five other leading professors. It distinctly claimed to be "a plain statement of *the whole truth*" regarding experimentation on living animals; and, referring to the occasional necessity of painful investigations, it went out of the way to make the strange assertion that "none such have been made in the Harvard Medical School within our knowledge."

Now this statement was either true—or untrue. I doubted its accuracy, and in the columns of the *Transcript* of July 22, I called attention to this most peculiar assertion. Surely a mistake had been made? But no explanation came. The oracles had spoken; the public must implicitly believe. Confronted with a statement like this, made by men of the highest scientific reputation, what is one's duty simply as a lover of truth? To accept it? To be silent? I must not decide for others; but, to me, it seemed that refutation

was demanded in the interests of Science herself. You say, sir, that I have "given the lie" to men whose "names and work are well known in all the scientific world." You are mistaken; I am not given to overstepping thus the amenities of discussion. But I brought out "in bold relief some of the more or less shocking features of the experiments" in Harvard Medical School, without at the same time touching either the object of the investigation or the results obtained. I admit it. Pray, what had these to do with the one question of the *painlessness* of the vivisections? How can there be any "shocking features" to *painless* research? The truth is, somebody blundered, and was too proud to confess it, even when confronted with the proof. Some may call that fidelity to science; but it is not my ideal of fidelity to truth.

Your comments upon the preliminary report of the American Humane Association would be more satisfactory if they could have been based upon the complete report, now in the printer's hands. I do not think that any scientific man, physician or otherwise, need be ashamed to find his name—where I place my own—beneath that of Herbert Spencer, in favor of vivisection regulated by law.

And, finally, permit me gently to protest against being classified by you or anybody else as an "antivivisectionist." Is there no middle ground within the scope of imagination? Cannot a man be temperate without being a teetotaler? It is fifteen years since I first wrote on this subject, and never a line that denied the utility or the rightfulness of vivisection, *per se*. But what I do abhor and execrate is the license, cruelty, and abuse that I have seen for myself. Does *The Medical News* deny that abuses exist? I wish denial were possible. Let me cite admission by a writer who has most accurately represented my views regarding this whole question. It is from a work what I have long admired for its bold and reverent treatment of one of the deepest problems with which the human intellect can engage; a work which I believe will be better known a century hence than it is to-day. "If," he says, with significant caution, "if a very limited use of vivisection-experiment is necessary for scientific and medical progress, *it must be regulated by law,* carried out with jealous guarding against excess and against suffering, and the maimed animals painlessly killed when the experiment is complete. The practice carried on by concerted jackanapes to prove over and over again already ascertained results, to minister to egotism, for didactic purposes,—*these are not necessary and must be forbidden.*"*

*In printing this letter, the Editor omitted the sentences which named him as the author of the paragraph thus quoted.

From whom am I quoting? From your own work on *"The Meaning and Method of Life."* That, sir, is a fair expression of my sentiments in regard to vivisection. I have never denounced its abuses with greater vigor, nor asked for more stringent regulation regarding it, than is here demanded by yourself.

I am, sir, etc.,

ALBERT LEFFINGWELL.

Cambridge, Mass., December 3, 1895.

[*From the* BOSTON TRANSCRIPT, *March 7, 1896.*]

THE ABUSES OF VIVISECTION.

To the Editor of the Transcript:

In course of my remarks before the Judiciary Committee, last Thursday, I read a portion of a private letter which may have an interest for your readers. The writer is one of Boston's leading physicians, a graduate from Harvard Medical School, and I presume a member of the Massachusetts Medical Society. It refers to his own experience abroad.

"When I was engaged in studying medicine in Paris, it was the custom of a distinguished physiologist to illustrate his lectures by operations upon dogs. Some of these dissections were not very painful; but others were attended with excruciating long-continued agony; and when the piteous cries of these poor brutes would interrupt his remarks, with a look of suppressed indignation he would artistically slit their windpipes and thus prevent their howling. Curiosity prompted me to inquire of the janitor, whether after this period of torment, these creatures were mercifully put out of misery; and I ascertained that such animals as did not succumb to the immediate effects of their mutilations were consigned to the cellar to be kept, unattended and unfed, until wanted for the following lectures, which occurred on alternate days. From the cellar-windows above their kennels the dismal moanings of these unfortunate sufferers could be heard as we passed; and yet I never noticed the slightest demonstration of sympathy in their behalf except on the part of a few American students. It is to be noted that these dogs were subjected to needless torture for the mere purpose of illustrating well-known, accepted facts, capable of being taught satisfactorily by drawings, charts, engravings or models; and hence this cruelty, being unattended by any possible benefit to either students or mankind, was illegitimate and unjustifiable. But when it is considered that these same experiments might have been conducted under the influence of an anæsthetic so as to minimize if not remove this needless suffering, this cold-blooded, heartless torture can only be characterized as contemptible, outrageous, monstrous.

"From detailed accounts communicated to me by eye-witnesses of the incidents related, I entertain no doubt that barbarous cruelty

was practised at that time in all the Parisian physiological laboratories, though it is probable that for novel and horrible experiments none could rival the infernal ingenuity in this business of that master-demon, Claude Bernard. And it remains a lamentable reproach to the scientists of France that similar abuses of vivisection, *degrading and brutalizing to students, as well as to the perpetrators,* are still tolerated in that country and unblushingly reported at medical meetings or in professional journals. If it should appear that any such wrongs were being perpetrated in the United States, the medical profession would, I believe, take prompt and effective measures to brand the delinquents and unceremoniously suppress the evil."

It will be seen that the writer, in characterizing Bernard's experiments upon dogs "for the mere purpose of illustrating well-known and accepted facts" as "needless, cold-blooded, heartless torture," had not the slightest idea that such methods were customary to-day in American institutions. When he began the study of medicine they were not in vogue, and he naturally believed that such abuses existed only on the other side of the ocean.

Would such experiments as these of Claude Bernard, excite the reprobation and indignation of professional physiologists to-day in America? Why should they? In that *"Statement in Behalf of Science,"* introduced by President Eliot and signed by most of the leading physiologists of this country, there is not a word that even suggests the possibility of "abuse." On the contrary, such experiments as these are apparently approved, so long as they are done by a man of science. This manifesto distinctly says: "As to whether or not, under given circumstances of research or teaching, an experiment involving pain should be performed, is a matter which should rest with the responsible expert by whom, or under whose direction, the thing would be done." That is the new creed. Claude Bernard was one of the most distinguished physiologists of Europe in his day; and the question of pain was for this "responsible expert" alone to decide. To the young Boston physician, he seemed "a master-demon;" but were he living to-day, there is hardly an American university that would not be glad to have him take charge of its physiological laboratory, and as a "responsible expert" direct the education of youth.

Are we advancing or retrograding? The future must decide. But, believing in vivisection, I must here part company with those who make the will of a vivisector superior to the moral obligations of other men.

ALBERT LEFFINGWELL, M.D.

Cambridge, Feb. 29, 1896.

[*From* THE POPULAR SCIENCE MONTHLY, *December, 1896.*]

SHALL VIVISECTION BE RESTRICTED?

Editor Popular Science Monthly:

Sir:—In his interesting and valuable contribution to the literature of vivisection, in the October number of your periodical, Prof. C. F. Hodge of Clark University makes one or two statements which are decidedly erroneous, and which I beg you will permit me to correct. Quoting from an article of my own on the same subject, published over twelve years ago in Lippincott's, he states that "a *recent* writer has actually cited mortality statistics to prove the futility of vivisection." This deduction is wholly incorrect. The very article from which he quotes, again and again affirms the use of vivisection. Exaggerated claims of potency, such as were rife when the article was written, some fourteen years ago, may certainly be challenged, without being carelessly translated into affirmation of "futility"; just as one may believe in experiments regarding aërial navigation without looking forward to lunar voyages.

With the gratuitous imputation of "unfairness" in the selection of statistics I am more seriously concerned, for no charge more vitally affects the character of scientific work. Professor Hodge admits, as he is forced to do, that "the figures do show that in England, since 1850, certain organic diseases have been on the increase, despite the slight advance in our knowledge of them." Well, that also is my own conclusion. Such facts as these "afford the strongest possible argument for the side of research." Again I agree with your learned contributor, although I should give the word "research" a wider meaning than he intends. But there was "unfairness" in the selection of diseases; "almost without exception these maladies lie very deep in the hereditary tendencies of the race." Well, I suppose death itself may be said to "lie very deep in our hereditary tendencies"; but, except in some such exceedingly broad sense, I certainly question the accuracy of his assertion. In my tables (see Lippincott's, August, 1884) only fifteen different classes of organic diseases were tabulated; from these causes only, result the deaths of two-thirds of the English race over the age of twenty years; and, as a rule, fatality increases with advancing age. Are these maladies "almost without exception" caused by "hereditary tendencies"? When the Archbishop of Canterbury, in the fullness of years, falls dead from apoplexy, is it because "defectives leave enfeebled progeny"? I certainly

differ with your contributor on this point. There was no unfairness whatever in concentrating attention upon organic diseases, *provided* it was distinctly admitted—as it was in the same article—that "during later years there has been a diminished mortality in England from the lesser prevalence of zymotic diseases," which nobody in 1884 was pretending to "cure."

One point more. Admitting the justification of vivisection *per se*, are we compelled to adopt the further evident conclusion of Professor Hodge that *it should be free to proceed to any lengths whatever*, as in Continental Europe? Because certain forms of vivisection are justifiable, *are all?* It is at this point we part company. He is a brave man who can announce in these days a new theological dogma, that "God clearly gives to man every sanction to cause any amount of physical pain which he may find expedient to unravel His laws." Certainly that is a dogma of the highest import; everything is justifiable; its far-reaching consequences touch humanity itself. With that doctrine I thoroughly disagree, though put forth by so eminent a teacher as Professor Hodge. Permit me rather to range myself with one whose work for science entitles him to even greater respect. On the wall of my library hangs a printed statement of views concerning this very subject, from which allow me to quote. "Within certain limitations, we regard vivisection to be so justified by utility as to be legitimate, expedient, and right. Beyond those boundaries it is cruel, monstrous, and wrong. Experimentation . . . we consider justifiable when employed to determine the action of new remedies, for tests of suspected poisons, for the study of new methods of surgical procedure or in the search for the causation of disease. . . . On the other hand, we regard as cruel and wrong the infliction of torment upon animals in the search for physiological facts which have no conceivable relation to the treatment of human diseases; or experiments that seem to be made only for the purpose of gratifying a heartless curiosity. . . . The practice, whether in public or in private, should be restricted by law to certain definite objects, and surrounded by every possible safeguard against license and abuse."

That statement, sir, is signed by Herbert Spencer, and with every word of it I agree.

ALBERT LEFFINGWELL, M.D.

Hamilton Club, Brooklyn, Oct. 15, 1896.

[*From* THE MEDICAL NEWS, *July 17, 1897.*]

THE BILL REGULATING VIVISECTION.

To the Editor of The Medical News:

Dear Sir:—Are scientific interests ever really promoted by misstatement of facts? I am sure that *The Medical News* does not think so; and that whenever inaccurate statements appear in its editorial columns, they are due to misinformation. The *News* regards with strong disapproval the bill now before Congress, placing the practice of vivisection in the District of Columbia under governmental supervision. But may not its sweeping condemnation rest upon imperfect information regarding the character and scope of this measure? Permit me at least to call attention to your editorial in the issue of July 3d, and to some grave errors of fact therein contained.

1. You affirm that this is a bill "abolishing animal experimentation in the District of Columbia," and that it is "destined to prevent all animal experimentation." If this were true, I confess I should regard such a measure with quite as much disfavor as yourself; but this charge, though again and again repeated, is wholly without basis of fact. I have had some slight influence in suggesting amendments to this proposed law, and I know that whatever restrictions the bill originally contained, it now permits all phases of inoculation experiments, all tests of drugs, of poisons, or of methods of surgical procedure, and in fact all other useful investigations upon living animals, whenever such experiments may be performed while the creatures are anæsthetized. (See Sec. 2, clause *c*.) Is this "abolition of experimentation?" The *News* has been misinformed.

2. You state that "the Humane Society of Washington is endeavoring to usurp to itself the power of controlling all animal experimentation" in Government laboratories and elsewhere. Upon what basis of fact does this statement rest? This Humane Society is not once mentioned in the bill, as reported for consideration; the President of the United States appoints the inspectors, and Government officers only have anything to do with experiment or experiments. To suggest that above these officials, is the usurping power of the Washington Humane Society, is to confer a potency of influence where none exists.

3. I am heartily sorry to learn in the same editorial that the advocates of this bill are in favor of preventing the occurrence of

"imaginary cruelties," for if abuses of vivisection are unknown, all effort toward prevention is wasted force. But *is* it all imagination? In his address before the American Academy of Medicine last year, the late editor of *The Medical News,* Dr. George M. Gould, said: "At present the greatest harm is done to true science by men who conduct experiments without preliminary knowledge to choose, without judgment to carry out, without true scientific training or method, and only in the interest of vanity. . . . I have adduced this single American experiment, but I purposely refrain from even mentioning the horrors of European laboratories. . . . Dr. Klein, a physiologist before the Royal Commission, testified that he had 'no regard at all' for the sufferings of the animals he used. . . . It may be denied, but I am certain a few American experimenters feel the same way, and act in accordance with their feelings." Does Dr. Gould here refer to "imaginary" evils? I adduce his name only as a witness, not as an advocate, for if I mistake not, he is as strongly opposed to the bill as yourself; but no writer has more forcibly presented the evils, to remedy which this bill was designed. I do not believe that, if it becomes a law, it will impede any form or phase of useful investigation.

ALBERT LEFFINGWELL, M.D.

Brooklyn, July 7, 1897.

[*From* THE MEDICAL NEWS, *August 7, 1897.*]

DR. SALMON'S CRITICISMS.

To the Editor of The Medical News:

Dear Sir:—In *The Medical News* of July 24th, I find what purports to be "a reply to Dr. Leffingwell," from Dr. Daniel E. Salmon, a veterinary surgeon, connected with the Department of Agriculture, at Washington. The privilege of reply by a person unaddressed is rather a matter of favor than of right; and the letter you did me the honor to print was intended only for the consideration of my professional brethren, and not for veterinary experts, however eminent in sciences pertaining to agriculture. Your correspondent would imply doubts as to my acquaintance with our mother-tongue; I shall not question his own evident familiarity with a vigorous vernacular, which has its place,—but that place is not in the consulting-room of medical men. Any formal rejoinder I do not care to make; but one or two points in his letter are so imbued with inaccuracy that I should like to refer to them.

"Is not the British bill sufficiently harassing and destructive to experimental research?" asks your correspondent, in a question that insinuates its own reply. I suppose no impression is more widely diffused among medical men in this country than the detrimental effects of the English law; Professor Bowditch of Harvard Medical School stated in his letter to Senator Gallinger that it had "inflicted a serious blow upon English physiology." Is this true? Who should know best—the opponents to all legislation in this country, or the medical men in England who have worked under this law for the last twenty years? I presume the *British Medical Journal* will be taken as a pretty good authority. In an article on "Physiology," which appeared in its issue for June 19 last, the writer says:

"There are at present signs that England will not be far behind Germany, or may even take the lead in the future. The antivivisection movement in this country, with which physiologists have had to grapple, has had some share in retarding the progress of physiology here. To-day, *though we have a vivisection act in operation, but few physiologists have had cause to grumble on this score, for the Act has been administered by successive Home Secretaries with wisdom and fairness.* To-day, also, we can hardly doubt that the antivivisectionists, though a noisy section, constitute a very small section of the public."

Where, sir, is there any complaint of serious injury here? But there is other evidence. In a letter I received not long ago from Sir John Eric Erichsen, the eminent surgeon, after stating that vivisections should not be allowed without proper restrictions, he adds: "Experiments on living animals are most carefully restricted in this country. . . . I acted as government inspector for several years, and I can safely assert that the provisions of the act were vigorously enforced, and never to my knowledge contravened." Can it be supposed that if the English law had worked such injury to medical science as some would have us believe, that no reference to such an effect would have been made by Dr. Erichsen?

Of course the law has been unsatisfactory to some. It has hindered and prevented repetition on English soil of the atrocities which the late Dr. John C. Dalton—a physiologist of no mean repute—tells us that he saw in a veterinary institution on the Continent, than which, he says, "nothing could be more shocking;" it has prevented those abuses of vivisection that the same eminent authority tells us have been done "by reckless, unfeeling, or unskilful persons;" it has hindered the free hand of men referred to by Dr. Theophilus Parvin

of Jefferson Medical College in his presidental address before the American Academy of Medicine lately, "who seem, seeking useless knowledge, to be blind to the writhing agony of their victims, and who have been guilty of the most damnable cruelties." I do not know to whom Dr. Parvin alluded when he affirmed that "these criminals are not confined to Germany and France, . . . but may be found in our own country;" but I am sure that wherever they are, they join with Dr. Salmon in affirming that *"no one can tell whose method of investigation is right or wrong,"* and that "research should be free." *"After* the furtherance of science, the saving of human life is the noblest object we have in view," says an English vivisector and physician. I cannot but think that it will be a sad day for the human race when that ideal shall be generally accepted by the medical profession.

ALBERT LEFFINGWELL, M.D.

Brooklyn, July 27, 1897.

[*From the* BOSTON TRANSCRIPT, *October 16, 1897.*]

THE VIVISECTION OF MAN.

To the Editor of the Transcript:

It seems to me that the news recently given by the Washington correspondent of *The Transcript* deserves more than a passing notice. A certain Dr. Sanarelli, apparently in charge of a quarantine station, boldly carrying into practice what others have taught, has been making experiments upon human beings in place of animals; experiments involving torture and the utmost danger to life. All the awful symptoms of artificially produced disease, thus inoculated, he tells us—"I have seen unrolled before my eyes, thanks to the potent influence of the yellow-fever poison made in my laboratory." It is absurd to fancy that the subjects of these experiments knew what was done, when for the relief of some trifling ailment they submitted to the prick of a needle, and were made *"material"* for experimentation. If anything could add to the supreme horror belonging to such a crime, it is that disguise as a physician under which this experimenter did his work.

It would be interesting to know how this bit of scientific intelligence has impressed the majority of your readers. Your correspondent, in that enthusiasm for scientific discovery which makes his contributions to your columns so often of exceeding interest, seemed to me to forget for a moment the claims of humanity; for he characterized discovery by Sanarelli's experiments as "certainly a

magnificent achievement," although he admits that people who are somewhat vaguely referred to as "unscientific persons," may be "disposed to criticise such experimentation." Does this imply that scientific persons are *not* so inclined? Must condemnation of such deeds be relegated to the despised class of "unscientific persons?" In short, it is possible for science to put a gloss upon the vivisection of man?*

You may fancy such questions too extreme in their significance; I am not so sure but that they have pertinence to our time. The Marchioness de Brinvilliers in the guise of a nun, testing her poisons on the patients of Parisian hospitals in 1667 is one picture; the American physician watching, hour after hour, the agonies of his victims, is her counterfeit presentment in 1897. Undoubtedly we are approaching a new era, full of mysterious import for humanity. The old standards of right and wrong seem to be passing away. The vivisection of animals has been pushed to its utmost limits; there are no new torments to be devised; every conceivable phase of agony has been inflicted again and again. Must Science, then, be condemned to fold her hands before problems yet unsolved? What —except sentiment—prevents science from making experiments upon those useless members of society to whom your correspondent alludes as the "lower orders of the people"; the pauper sick, the friendless and the outcast poor, that are always with us? May not Lazarus contribute to discovery as well as the dogs? Mysterious hints as to justifiable extremes are not wanting. In the *Popular Science Monthly* of just a year ago, one of the most distinguished vivisectors of Massachusetts, evolving from his inner consciousness a new theological dogma, boldly proclaimed that "God clearly gives to man every sanction to cause any amount of physical pain which he may find expedient to unravel His laws." "The aim of science," says another scientific writer in the *New York Independent* of December, 1895, "is the advancement of human knowledge at any sacrifice of human life. If cats and guinea pigs can be put to any higher use than to advance science we do not know what it is. We do not know of any higher use *we can put a man to.*" "A human life is nothing compared to a new fact." Probably both of these writers would indignantly disclaim the imputation of encour-

* In describing the sufferings of his victims, Sanarelli speaks of "violenta cefalalgia," "vomito incoercibile," "dolori angociosi," "tenismo spasmodico"; one suffers "immensamente," etc. In two cases, the fever caused degenerations of the liver or kidneys,—tending to the shortening of life.

aging murder; but why was language employed of such sweeping significance?

For myself, I have no language at command sufficiently strong to phrase my opinion of a man who, in the garb of a physician, could be guilty of such a crime. I believe that such experiments would be equally condemned by the majority of the medical profession in the United States—not connected with laboratory work. But private disapproval is not enough; and at no distant day I venture to hope that the Massachusetts Medical Society, which has so strenuously opposed all legislation regulating the vivisection of animals, may, by formal resolution, set the seal of its equal disapproval upon the vivisection of man.*

ALBERT LEFFINGWELL, M.D.

Hamilton Club, Brooklyn, N. Y., Oct. 7, 1897.

[*From the* BOSTON TRANSCRIPT, *November 3, 1897.*]

HUMAN VIVISECTION.

To the Editor of the Transcript:

I am indebted to your correspondent, Dr. Luigi Galvani Doane, whose antipathy to vivisection in any form is well known, for pointing out phraseology in my recent letter which it seems is capable of misinterpretation. It is my belief that a large majority of the medical profession, whose office, as Dr. Doane once wrote, "is to save life, not to take it," would unqualifiedly condemn such experiments upon human beings as were described in the *Transcript*. That, among scientific "experts," whose life-work is not to heal, but to investigate, such condemnation would be less emphatic and less general, is also my impression. It is probable that neither approval nor condemnation would be confined to either class.

By many of the strongest opponents of vivisection it is held that the practice of experimentation upon animals necessarily leads directly to the far graver practice of experimentation upon man. Not presuming to certainty, it seems to me that the atrocities of vivisection and the subjection of human beings to such experiments

*Up to January 1, 1901, no public condemnation of experiments upon human beings had been made by this Society. Some of the worst experiments in human vivisection, made in part upon dying children in an "Infant's Hospital," were performed by a Boston physician, connected with Harvard Medical School, and presumably a member of this Society. [See editorial article in the Philadelphia POLYCLINIC for Sept. 5, 1896.]

do not stand in the relation of cause and effect, as suggested by your correspondent, but spring from identical causes. The chief of these causes, in my opinion, is that dogmatic teaching, so carefully inculcated for the last quarter of a century, which glorifies any "scientific fact," no matter at what cost of torment it may have been acquired. When men and women in institutions of learning have reached a point where they can affirm that "morality has nothing to do with vivisection;" that the "question of pain should be left absolutely to the decision of the experimenter, who alone can decide what degree of pain he needs to inflict for the success of his experiment;" that "vivisection should be subject to no criticism or restrictions of any kind," and that "science does not place reverence for pity higher than its reverence for any new fact," it seems to me that they are not very far from a position where if only new scientific facts were thereby to be acquired, they could regard, with approval, experiments upon their kind. But this is not the ground occupied by all who are not antivivisectionists. When I read, in a statement of opinion indorsed by many physicians, that "our humanity invests us with certain moral obligations toward the lower forms of life; that the power to kill does not cover the right to torture; that our power is responsible; that the question of inflicting pain should not be left to the judgment of each experimenter, but the whole practice (of vivisection) should be regulated by definite laws, confined to certain objects and permitted only to competent and trustworthy persons," I find myself confronted by altogether different opinions; nor does it seem to me that a physician, who thus conscientiously recognizes his moral responsibility to the lowest forms of life capable of suffering, will ever yield to the temptation to make dangerous or painful experiments upon "the lower orders" of his fellow-men.

ALBERT LEFFINGWELL, M.D.

Brooklyn, November 1, 1897.

[*From* THE PHILADELPHIA MEDICAL JOURNAL, *March 18, 1899.*]

AGAIN THE VIVISECTION QUESTION.

To the Editor of The Philadelphia Medical Journal:

Sir:—In your issue of February 25, just at hand, under the heading "The Antivivisection Method," I find reference to my paper, recently printed by the U. S. Senate as Document No. 78. To exclamatory criticism, such as there appears, I cannot object, for it is a method of argument as old as the race, and is rather compli-

mentary than otherwise. But to distinct misrepresentation, I have very decided objections; and as a subscriber to your periodical, I ask the privilege of its columns for correction of the impression it has so erroneously conveyed.

Your assertion that my paper is "the usual farago of prejudice against the method" (animal experimentation), gives the distinct impression, first, that I am opposed to the practice of animal experimentation as a method of research, and, secondly, that the paper was devoted to that subject. In both respects this characterization is erroneous. There is not a single word in my paper denying the utility of vivisection, *per se*. On the contrary, over and over again, its value is distinctly admitted: "Notwithstanding the opinion of that eminent surgeon, Lawson Tait, that 'nothing whatever has been gained by vivisection,' it has always seemed to me more probable, that in certain directions, vivisection within limitations was of such practical and potential utility as to justify its use." (p. 12). Such statements are frequent in the paper, and in everything I have ever written.

I especially deny *your* right to call me an "antiviviseotionist." Why? Because no man has more accurately stated my views in regard to vivisection than the editor of the *Philadelphia Medical Journal*. With you, sir, I believe that "scientific men have made a grave mistake in opposing the limitations of vivisection experiment to those fitted by education and position, properly to choose and properly to execute such experimentation;" that "much good would come from our perfect readiness to accede to, nay, to advocate, the antivivisection desire to limit all experimentation to chartered institutions, or to such private investigators as might be selected by properly chosen authority;" that "at present, the greatest harm is done true science by men who conduct experiments without preliminary knowledge to choose, without judgment to carry out, without true scientific training or method—and only in the interest of vanity;" that "every laboratory should publish an annual statement, setting forth plainly the number and kinds of experiments, the objects aimed at, and, most definitely, the methods of conducting them;" that "foolish secrecy feeds the flame of passionate error;" and that "if a very limited use of vivisection experiment is necessary for scientific and medical progress, it must be regulated by law, carried out with jealous guarding against excess and against suffering." These are your views. They are mine. They are not the sentiments of antivivisectionists.

Permit one word more. No scientific man regrets more than I do

the present situation. It is tempting men of the highest reputation into loose and exaggerated statements, utterly foreign to the interests of truth. If any compromise be possible, it is along lines indicated by yourself in the address delivered before the American Academy of Medicine, less than three years since. You do not approve of unlimited experimentation. You have denounced with emphasis "the atrocities that have stained the history of Latin vivisection," and American vivisectors who "are a disgrace both to science and to humanity," and whose "useless and unscientific work should be stopped." The bill now before Congress, meets, for reasons which I do not comprehend, your most absolute disapproval. Will you not, then, suggest something better? For myself, I believe that it would be entirely possible for a bill to be drawn up, based only on the principles which find expression in your writings, which would be accepted and supported by the great majority of those who are now supporting the present measure, not because it is ideal, but because it seems to offer the only hope of remedying the abuses which you admit. ALBERT LEFFINGWELL.

February 27, 1899.

[*From the* BOSTON MEDICAL AND SURGICAL JOURNAL, *April 19, 1900.*]

A NEW METHOD OF CRITICISM.

To the Editor of The Boston Medical and Surgical Journal:

Dear Sir:—Simply in the interest of scientific accuracy, will you permit me to utter a gentle protest against the method employed by Professor James J. Putnam of Harvard Medical School, in that criticism of my pamphlet which he has recently contributed to your columns? Of his many inaccuracies and mistatements I shall not speak, but one or two peculiarities of his method so touch the ethics of all criticism, that I ask for space to refer to them.

It would seem a matter beyond any possible questioning, that Professor Putnam had no sort of right to change the language of a statement which I had criticised, in order to render my criticism void and inaccurate. This is precisely what he has done more than once. For instance, Professor Putnam calls attention to what he describes as "the statement, originally made, I believe, by Ludwig, and cited by Mosso in the biography of his great teacher, to the effect that *many experiments* would be made impossible by the occurrence of pain. Dr. Leffingwell rejoins," etc.

Now I "rejoined" to nothing of the kind. Mosso "cited" nothing of the kind either from Ludwig or anybody else. In my pamphlet *"Does Science Need Secrecy?"* I quoted Mosso's words from the

London Lancet's translation: "It is an error to believe that experiments can be performed on an animal which feels"; I quoted from a manuscript that Professor Mosso sent me himself: "It is an error to think that one can experiment on animals that have not lost sensation"; and I now quote from the original essay in *La Revue Scientifique* of July 27, 1895: *"C'est une erreur de croire que l'on peut faire des experiences sur un animal qui sent."* That statement —whether in the original or in either of its translations—is absolutely untrue,—and I said so in my pamphlet. Professor Putnam sees it as well as anybody; but he also sees that by changing Mosso's language, and inserting the word "many" before "experiments" he could frame a statement that could not be disputed. To do this—and then to quote me as "rejoining" to a statement *manufactured by himself*—is that in accord with the ethics of controversy as Professor Putnam understands them? To be sure he admits in a footnote that he is not giving "the exact expressions used" by Mosso, since he had no "access to the original." I leave it to your readers to value that excuse at its worth.

Let me cite yet another instance. Dr. Leffingwell, he says, *"denies the justice of the claim which Professor Porter makes,* that animals are kept from suffering *any considerable pain"* when vivisected under anæsthetics or narcotics at the Medical School. Absolutely untrue; Professor Porter made no such claim, and I have certainly made no such "denial." That which I criticised in the pamphlet was something entirely different. In the *Boston Transcript,* Professor Porter and his associates had declared in regard to "painful vivisections" that "such investigations are rare. *None such* have been made in the Harvard Medical School within our knowledge." That statement was certainly untrue; nobody defends it since I pointed out the experiments of Dr. Ott—to say nothing of the investigations of Professor Porter himself. Dr. Putnam clearly perceives its untruth; so he carefully constructs a new sentence; puts it into the mouth of Professor Porter as being what he "believes to have been Professor Porter's meaning,"—and then cites me as "denying" it! If others believe in this method of controversy, I do not; and I must protest against being quoted as opposing assertions manufactured by my critic, for the sole purpose of rendering my own criticism void. I cannot regard it as a very laudable line of conduct, or as one that in any way tends to the elucidation of truth.

ALBERT LEFFINGWELL, M.D.

April 11, 1900.

[The above letter was printed under the heading "DR. LEFFINGWELL PROTESTS." A caption less personal has been substituted.]

CORRESPONDENCE.

I.

[FROM PROFESSOR GRAHAM LUSK, PROFESSOR OF PHYSIOLOGY IN UNIVERSITY AND BELLEVUE HOSPITAL MEDICAL COLLEGE.]

Albert Leffingwell, M.D.

Dear Sir:—"Is science advanced by deceit?" Does not morphia destroy sensitiveness to pain? Do you consider your writing entirely free from exaggeration and deceit?

Yours truly,

GRAHAM LUSK.

[*Prof. Lusk enclosed a page from the essay: "Is science advanced by deceit?" referring to experiments of Beyer on the isolation of the heart, during which the whole front and side of the thorax were cut away, the dogs being under morphia and curare. He underscored the words, "morphia being administered."*]

II.

Prof. Graham Lusk, Ph.D., Professor of Physiology,
University and Bellevue Hospital Medical College, N. Y.

Dear Sir:—Your note without date has but just come into my hands. I am so accustomed to receiving anonymous letters of a similar character, that your favor is a welcome change.

Referring to my brief account of certain extreme vivisections by Beyer, wherein morphia was used with *curare,* you ask in a tone of triumphant confidence: *"Does not morphia destroy sensitiveness to pain?"*

Such a question, not from a layman or a medical student, but from the professor of physiology in one of the leading medical schools of this country, deserves more than a brief reply. It is an astounding revelation. You are alluding to some of the severest of all mutilating vivisections; you are supposed to be perfectly familiar with all that pertains to that art to which you have devoted your life; and you put the question in a way that affords no doubt of your own belief. It is true that such inquiry might be put by some men with intent to suggest as true what the inquirer knew to be false; but that dishonor, I will not for a moment impute. I shall assume, then, that you asked the question in good faith; and it merely serves to demonstrate how much ignorance in high places science has yet to combat.

Permit me to refresh your memory a little. To a professional vivisector like yourself, I dare say that no array of mere opinions

or statements would be at all valued in comparison with evidence based upon animal experiments. Let me call your attention therefore, to the works of one who, perhaps, was the leading physiologist of his time, Claude Bernard of Paris. You know, of course, how France honored him while living as the foremost representative of one branch of scientific workers; how she gave him a public funeral at the expense of the State, in the draped cathedral of Notre Dame, and how to his memory, she has erected a monument on one of the public streets. It was Bernard's custom when I saw him in Paris, to illustrate his lectures by vivisections, and by repeated demonstrations to establish his statements of fact. Let me call your attention to the following quotation from one of his lectures before the College de France to be found in his *"Leçons sur les Anesthesiques;"* the italics being mine.

His opening words are significant: *"Commençons par établir les faits,* et nous raisonnerons ensuite sur eux en déduire les propriétes des alcadoïdes de l'opium . . Voici un chien qui a reçu avant la séance la dose indiquée. Vous voyez qu'il reste inerte, et sans mouvements. Nous allons répétir l'experience *sous vos yeux* sur un autre animal. .. . Vous voyez que l'animal est tombé dans un état de stupeur qui le laisse absolument immobile, car il est évident que, s'il n'avait pas reçu de la morphine, il ne resterait pas ainsi étendu sur cette table sans chercher à s'echapper. Il a donc perdu la conscience du lieu où il est; il ne reconnaît plus son maître. *Cependent la sensibilité persiste.* . . Toutefois, *loin de supprimer complétement la sensibilité comme le chloroforme,* la morphine provoque, chez nos animaux une sorte d'exaggeration de l'excitabilite, ou, plutôt une epéce de sensibilité particulière au bruit." (p. 196.)

In another case, Bernard experiments upon a dog which he had previously used in like manner a day or two before:

"Ce chien retombe dans le même état de torpeur qu'il avait déja subit. Mais, je ferai remarquer que, ainsi que je l'ai déja dit, *malgré cet état de torpeur, l'animal n'est pas insensibible, comme le serait devenu sous l'influence du chloroforme.* Bien que dans un état de torpeur, *l'animal est donc excitable et sensible."* (p. 222.)

"Notwithstanding this condition of torpor," says Bernard, "the animal is not insensible, as he would be under the influence of chloroform,"—but on the contrary he "is excitable and sensible." That is the answer that science, based upon experimentation, makes to your question.

Over and over again, Bernard affirms this. Take, for instance, another course of lectures, comprised in his book: *"Leçons de*

Physiologie Opératorie," wherein he again refers to the use of morphia. After administering morphine to a dog, he goes on to say:

"*L'animal reste encore sensible:* en touchant la cornée, on provoque l'occlusion des paupieres; mais il est très-calme, et se prête sans réaction aux opérations les plus délicates. Placé à terre, le chien peut encore se mouvoir, marcher, aller se cacher; placé dans la gouttière à vivisection, il y demeure immobile et stupéfié; jamais il ne cherche à mordre, quelque operation qu'on lui fasse subir; *il sent la douleur,* mais il a pour ainsi dire, perdu l'idée de la defense." (p. 155.)

It is unnecessary to multiply such quotations. Repeatedly Bernard demonstrated and declared that, while morphia stupefies or reduces to a state of torpor, it does not—in vivisection—"destroy sensitiveness to pain." This conclusion he based, not upon authority, but solely upon that special evidence which you so highly esteem,—experimentation upon living animals.

Performing his experiments before the eyes of his students, he demonstrated that the animal is "not insensible, as it would be under the influence of chloroform," and that *"it feels the pain."* And yet at the very close of the century, in which he lived, the professor of physiology in the "University and Bellevue Hospital Medical College" is ignorant of the work of the leading physiologist of his age; is teaching his students, that animals when vivisected under this narcotic, are without sensibility to suffering, and,—referring to one of the severest of vivisections,—not only asks me with a sneer,—"Does not morphia *destroy* sensitiveness to pain?" but imputes deception because that information was withheld!

You suggest introspection regarding my work. Let me assure you, that no man can do me any greater service than to point out my mistakes. Of the value of his own work, no one can rightly judge. To me, at any rate, it seems worth doing. By maintaining that a scientific method should stand on its own merits; by condemnation of its abuses and by advocacy of their reform; by exposure of the ignorance or mendacity of some so-called scientists; above all, by protesting that falsehood, equivocation or exaggeration on the part of a scientific teacher with intent to delude a confiding public, is dishonorable to the man and dishonoring to the cause he claims to serve, I am doing what little I can to defend Science from her worst foes and to maintain the sanctity of scientific truth.

Sincerely yours,

Albert Leffingwell.

Hamilton Club, Brooklyn, N. Y.,
Dec. 31, 1900.

LEGISLATION CONCERNING VIVISECTION.

The following outline of a proposed bill indicates what is meant by the State regulation of vivisection. It simply provides that a practice liable to great abuses, shall be made subject to the supervision and control of the Government; that the privilege of experimentation shall be accorded only to persons of good repute; that cruelty—so far as possible,—shall be prevented, and that by official reports, the sum total of accomplishment,—and its cost,—shall be matters of official record.

With but few modifications, the following is substantially the "Bill for the Regulation of Vivisection," which has been introduced into the Senate of the United States, by Hon. J. H. Gallinger of New Hampshire.

A Bill for the Regulation of Vivisection in the District of Columbia.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That hereafter no person shall perform on a living warm-blooded animal any experiment calculated to give pain to such animal, except subject to the restrictions hereinafter prescribed. Any person performing or taking part in performing any experiment calculated to give pain in contravention of this Act shall be guilty of an offence against this Act, and shall, if it be the first offense, be liable to a penalty of not exceeding one hundred and fifty dollars, and if it be the second or any subsequent offense, shall be liable, at the discretion of the court by which he is tried, to a penalty not exceeding three hundred dollars, or to imprisonment for a period not exceeding six months.

Sec. 2. That the following restrictions are imposed by this Act with respect to the performance on any living warm-blooded animal of an experiment calculated to give pain to such animal; that is to say:

(a) The experiment must be performed with a view to the advancement of knowledge which will be useful for saving or prolonging life or alleviating suffering, or to the acquirement of surgical experience or information likely to be of use in operations upon human beings or domestic animals; and

(b) The experiment must be performed by a person holding such license from the Commissioners of the District of Columbia as in this Act mentioned, or by a duly authorized officer of the Government of the United States, or of the District of Columbia; and

(c) The animal must, during the whole of the experiment be under the influence of ether or chloroform (or any other recognized anæsthetic) sufficiently to prevent the animal from feeling pain; excepting only, that in so-called inoculation experiments, or in tests of drugs, or medicines, or foods, or in experiments relating to

the communicability of disease, the animal need not be anæsthetized nor killed afterwards, nor in tests of surgical procedure need animals be kept anæsthetized during the process of recovery from the surgical operation. Otherwise than this the animal must be kept from pain during all experiments; and

(d) Except in experimental surgical operations, if the pain caused by the experiment is likely to continue after the effect of the anæsthetic has ceased, or if any serious injury has been inflicted, the animal must be killed before it recovers from the influence of the anæsthetic which has been administered; and

(e) The substance known as urari or curare shall not, for the purposes of this act, be deemed to be an anæsthetic; and its use and purpose must be reported in every experiment where it is employed; and

(f) No experiment shall be made upon any living creature, calculated to give pain to such creature, in any of the public schools of the District of Columbia; *Provided only* that experiments may be performed under all of the provisions of this Act, by a duly licensed experimenter in giving illustrations of lectures in medical schools or colleges.

SEC. 3. That every place for the performance of experiments upon living animals shall be approved by the Commissioners of the District, and shall be registered in such manner as the said Commissioners may direct.

SEC. 4. That the Commissioners of the District, upon application as hereinafter prescribed, may license any person whom they may think qualified to hold a license to perform experiments under this Act; *Provided only,* That a license to perform experiments upon living animals shall not be granted to any person under the age of twenty-one; nor to any except persons of good moral character, nor,—without satisfactory proof to the contrary adduced,—to any person alleged to be of cruel or perverted instincts, or charged with the previous performance of experiments upon animals in a cruel and inhuman manner. All such licenses shall terminate on December 31st of each year; but may be renewed, for another calendar year, at the discretion of the Commissioners, upon written application of the person so licensed.

SEC. 5. That the Commissioners of the District shall direct each person performing experiments under this Act, to make a sworn report to them on the first day of January and July of each year, stating the methods and anæsthetics employed; the number and species of animals used, and the results of his or her experiments, in such form and with such further details as the said Commissioners may require; *Provided only,* that the publication of any report of any series of experiments alleged to be incomplete may be postponed at discretion of said Commissioners for a period not exceeding six months. Otherwise than this, all such reports shall be published.

SEC. 6. That the President of the United States shall cause all places where experiments on living warm-blooded animals are carried on, in the District of Columbia, to be, from time to time visited and inspected without previous notice for the purpose of

securing compliance with the provisions of this Act; and to that end shall appoint four inspectors, two of whom shall be laymen, who shall serve without compensation, and who shall have authority to visit and inspect the places aforesaid, and who shall report in writing to the President of the United States from time to time the results of their observations therein; and such reports shall be made public by him.

SEC. 7. That any application for a license under this Act, to perform experiments upon living animals, must be accompanied by proofs of good moral character, and must be signed by three physicians duly licensed to practice and actually engaged in practicing medicine in the District of Columbia, and also by a professor of physiology, medicine, anatomy, medical jurisprudence, materia medica, or surgery in the medical department of any established college in the District of Columbia.

The Commissioners of the District may at any time disallow or suspend any license given under this section.

SEC. 8. That the powers conferred by this Act of giving a license for the performance of experiments on living animals may be exercised by an order in writing, under the hand of any judge of a court of record having criminal jurisdiction in the District, in a case where such judge is satisfied that it is essential for the purpose of justice in a criminal case to make such experiments.

INDEX.

Abernethy, on vivisection, 26.
Abnormal satisfaction, 87, 194.
Abolition of pain, when impossible, 164, 165.
Abolition of vivisection, 35.
Abuses of vivisection, 9, 10, 12, 26, 27, 28, 29, 35, 43, 44, 45, 49-50, 67, 72, 75, 101, 108, 130, 169, 170, 238, 239, 241, 247. 248.
Abuses, defended, 173; punishment of, impossible, 197.
Academy of Medicine, Presidential address, 194.
Accidents, preventable, 231; statistics of, 232.
Adams, Dr. Charles Kendall, 61.
Address before U. S. Senate Committee, 1896, 97.
Address before U. S. Senate Committee, 1900, 190.
African Slave Trade 209; defense of, 211-215.
Alfort, Vivisection at, 27.
Ambition to imitate, 88.
American Academy of Medicine, 100, 117, 194.
American Colleges, vivisection in, 53.
American Humane Association, 172, 240.
American Medical Association, 162, 191.
American Physicians, Association of, 168.
American Society of Military Surgeons, 162.
American Statistics, 34, 176.
American Vivisection, instances of, 13, 48, 49, 50, 102, 117, 166.
Anarchy, Scientific, 200.
Animals, torture of, a phase of perversion, 194.
Anæsthetics, 25, 108, 109, 110, 156, 254; "habitually administered," 162; "given when required," 162; "whenever practicable," 162; useful to lull public opinion, 167.
Angell, Dr. James B., pres., 60.
Anthony, Dr., on Magendie's experiments, 12; on sensibility, 24.
Antitoxin, 180; value questioned, 181; statistics, 181.
"Antivivisection Bill" misstated, 143.
Apoplexy, its proposed "cure," 145.
Artificial respiration, 124.
Atrocious torture, 94.
"Atrocities that never existed," 115.

Bacteriology, Dr. Wilson on, 150.
Beginnings of Reform, 213.
Bell, Sir Charles, 15; letter to his brother on vivisection, 26.
Bellevue Hospital, mortality at, 178.
Bellevue Medical College, vivisection at, 17, 139.
Benefit to Humanity, 126, 127, 128.
Benezet, Anthony, 213, 234.
Bentham, Jeremy, 73; his strange bequest, 74.
Berdoe, Dr. Edward, 69; on Porter's experiments, 121.
Bergh, Henry, 1.

Bernard, Claude, experiments of, 3, 99, 113; the ideal physiologist, 92; a "master-demon," 241; on properties of morphia, 254, 255.
Bert, Paul, 99.
Bethlehem Hospital, 207.
Beyer, Dr. H. G., experiments of, 167.
Bigelow, Prof. Henry J., on effects of vivisection, 48, 95; "cold-blooded cruelty," 116.
Bigelow, Dr. Jacob, on typhoid fever, 148.
Bills for Regulation of Vivisection, 245, 256.
Boston vivisections, 132.
Bowditch, Prof. H. P., 114, 116, 124, 127, 131.
Brachet, Dr., tortures by, 9.
Bright, John, opponent of reform, 225.
British Medical Association, 199.
British Medical Journal; on Watson's experiments, 137; human vivisection, 187; regulation of vivisection, 247.
Brougham, Lord, opponent of reform, 225.
Browning, Elizabeth Barrett, 223.
Brown-Sequard, Dr., 5, 82, 99, 113; "his beautiful method," 124; experiments on spinal cord, 139.
Brutalization of childhood, 90.
Burden-Sanderson, Dr., 29.
Burroughs, Sir George, 7.
Busey, Dr. S. C., 145-147, 149-150.

Capen, Dr. E. H., pres., 62.
Carnivora, our inheritance with, 96.
Carpenter, Dr. W. B., on sensibility, 23.
Carter, Dr. Franklin, pres., 62.
Castex, Dr., experiments of, 44.
Catholic Church, on duty to animals, 76.
Chauveau, Dr., cruelty of, 44, 82, 141, 165.
Chemical Soc. of Washington, 169.
Child-labor; in factories, 224; in mines, 227.
Children, inoculated with syphilis, 187, 188; other cruelties toward, 223, 227, 228.
Chloral, not an anæsthetic, 122; use at Harvard, 129, 130.
Christianity, ideals of, 79.
Clarkson, Thomas, 213.
Coal-mines, conditions before their supervision by the State, 227.
"Cold-blooded cruelty," 116.
College de France, 5, 254.
"Common events" in research, 185.
"Conceited jackanapes," 100, 193.
Confucius, doctrine of, 79.
Contradictions of experimentation, 22, 25.
Cornell University, 55, 62.
Councilman, Prof. W. T., 114.
Crile, Dr., experiments of, 50.
Criminal vivisectors, 100.
Crucifixion of animals, 107, 201.
Cruelties of slave-trade, 210, 211.
Cruelty, (before State control) in prisons and jails, 205, 206; in treatment of insane, 207, 208; in factories, 223; in coal mines, 228.
Cruelty, as amusement, 91; John Stuart Mill on, 193; certain, without legal restraint, 99; of our ancestors, 205; why defended, 225, 226; extenuated by respectability, 233; of sport and butchery, 81; of vivisection, denied, 168; impossible if defined by vivisectors, 169;

Cruelty—*Continued:*
instances of, 169, 170; how excused, 172, 173.
Curare, properties of, 119; "the most cruel of poisons," 165; not an anæsthetic, 166; use by Beyer, 166-167; use at Harvard Medical School, 120, 124, 125, 127, 128.
Cyon, Prof., on the "joyful excitement" of vivisection, 94.

Dalton, Prof. J. C., on abuses, 27; experiments on nerves, 14; on spinal cord, 139.
"Damnable cruelties," 100.
Dangerous ideals, 91.
Dangerous instruction, 186.
Darwin, Charles, 8; theory of, 77.
Day, Dr. James R., pres., 60.
Deceit, Is science advanced by, 152.
Defense of an infamy, 214.
Denials of cruelty, 214; may be valueless, 171; when occasioned by self-interest, 226; or made by equivocation, 110.
Difficulties of definition, 20, 75, 108.
Diphtheria, 180-182.
Discoveries not prevented, 182.
District of Columbia; Med. Soc. of, 162, 168; law against cruelty, 171; vivisection in, 198.
Does Vivisection need Concealment? 106.
Dogs, as "material," 49, 124, 125, 129, 130, 136, 137.
Duty, definition of, 78; to animals, 80.
Duty of scientific doubt, 114.
Dwight, Dr. Timothy, pres., 59.

Effect of Vivisection, 41.
Effect of legislation, 193.
Egotism, vivisection to serve, 110.
Eliot, Dr. Charles W., pres., 59, 217, 230.
Eliotson, Dr., 9, 10.
Ellis, Dr., 125, 126.
England, humane feeling in, 30; its scientific decadence denied, 186; contrast with America, 28; Eighteenth century conditions, 206, 207; mortality statistics of, 145, 178, 179, 181-182.
Equivocation, doctrine of, 152; not suitable for science, 109; some instances of, 156, 160-163.
Erichsen, Sir John Eric, 196.
Ernst, Prof. H. C., 114, 129, 157.
Erskine, Lord, how greeted, when proposing reform, 84.
Ether, discovery of, 11.
Exaggeration of utility, 31, 174.
"Excellent fooling," 111.
Experiments in schools, 93.
"Extreme delight," Mantegazza's, 170.
Eye, inoculations into the, 157, 158.

Faith in scientific authority, 112.
False inferences, 163.
Farquharson, Dr., 122.
Fayrer, Sir J., 41, 186.
Fergusson, Sir Wm., 8, 11, 107.
Ferrier, Dr. David, 28.
Fire, death by, 81.
Flint, Prof. Austin, 6, 13, 16, 29, 30, 99, 140.
Food inspection by the State, 104.
Foreign ideals of research, 238.
Foster, Dr. Michael, 29.
Frederic, Harold, 110.
Free vivisection, 35, 200.
Freezing, experiments in, 72, 165.

Gates, Dr. G. A., pres., 61.
Goltz, Prof., cruelties of, 67, 99, 169, 177.
Gould, Dr. George M., 47, 100, 136, 193, 240, 241, 246, 252.
Government supervision, 97.
Great Britain, medical rank of, 102.
Gull, Sir William, 12, 29.

Hamilton College, Vivisection at, 66.
Hare, Dr. H. A., 192.
Harper, Dr. W. R., pres., 60.
Harvard Med. School, painful experiments denied, 122; use of *curare*, 123, 124, 127, 128; painful experimentation, 121, 124, 128, 130; singular ignorance of the Dean, 127; Porter's experiments, 130, 131; definition of cruelty, 172; "plain statement of the whole truth" challenged, 132.
Harvard University, vivisection at, 53.
Haughton, Dr. Samuel, one effect of vivisection, 95.
Herman, Dr. Edward, on antitoxin, 180, 181.
Herman, Prof., objects of vivisection, 32, 174.
Hodge, Prof. C. F., reply to, 243; new religious dogma of, 244.
Hooper, Dr., experiments of, 125.
Horseley, Dr. Victor, 109.
Howard, John, 206, 234.
Humane Association, American, 184, 186.
Humane sentiment, growth of, 205.
Humane vivisection, 187, 248; "a pardonable crime," 249; probable causes of, 251.
Huxley, Prof. T. H., 8, 10, 82.
Hyde, Dr. Wm. D. W., pres., 63.
Hydrophobia, 179, rarity of, 180.
"Hyprocritical humanity," 230.

Ideals, dangerous, 82; unworthy of emulation, 67.
Ignorance in high places, 254.
"Imaginary cruelties," 246.
Incitements to cruelty, 87.
Increased mortality of certain diseases, 33, 243.
Increase of vivisection, 71.
"Incurable injustice," 212.
Infamy, how defended, 214.
Influence of vivisection upon hospital experimentation, 102.
Inhumanity; among physiologists, 10, 169; as sport, 87.
Inoculation experiments, their painfulness denied, 156; definition of, 157; painfulness proven, 157, 158, 199.
Inspection of laboratories, 195.
Intelligence, a measure of sensibility, 24.

Jacobi, Dr. Mary Putnam, 167, 180.
James, Prof. William, 87.
Jordan, Dr. David Starr, pres., 62.

Keen, Dr. Wm. W., 191, 216.
Klein, Dr. Emanuel, experiments of, 158; indifference to animal suffering, 9, 94, 101.
Koch, Dr., "Consumption Cure" of, 41.
Krafft-Ebing, Dr., on torment of animals, 194.

Laboratories, supervision of, 195.
Lancet, The, 113, 118.
Latour, Dr., on Magendie's cruelty, 28, 154.

Legislation, where unacceptable,—199; suggested, 256.
Lessons of History, 232.
Limitations of vivisection, 17, 35-36.
Lister, Dr., on pain, 24.
Lobelina, experiments with, at Harvard Med. School, 123.
London, statistics concerning, 179, 182.
Lubbock, Sir John, mistake of, 11.
Luciani, experiments of, 165.
Lunatics, former treatment of, 207.
Lusk, Prof. Graham, correspondence regarding morphia, 253.

Macaulay, Lord, on cruelty, 205.
Macphail, Dr., mistakes of, 37.
Magendie, F., barbarities of, 5, 10, 12, 26, 28, 113, 154, 236; experiment on human being, 31.
Manning, Cardinal, 76.
Mantegazza, Prof. P., barbarities of, 27, 44, 67, 82, 94, 99, 113, 170, 197.
Massachusetts Medical Society, 116, 250.
"Master-demon," a, 238.
Masquerading a lie, 111.
Maternal affection, experiments upon, 169.
Medical News, letters to, 239, 245.
Mills, John Stuart, on cruelty, 193.
Mills, Dr. Wesley, 93, 106-110.
Minot, Prof. C. S., 114.
"Mistaken humanity," 230, 231.
Mistakes of certain scientists, 134.
Modern ideals, of science, 92; of scientists, 67.
Morphia, not an anæsthetic, 255; its use at Harvard Med. School, 121, 123, 130.
Mosso, Prof., strange statement by, 113.
Murchison, Dr. Charles, 147, 149.
Murderous mania, 95.
Myxœdema, 180.

Narcotics in vivisection, 119; not anæsthetics, 121.
National Academy of Sciences, its statements questioned, 156, 163, 220.
National humanity, 27.
Nature and cruelty, 193.
Nature's secrets, 92.
Needless sacrifice, effect of, 88.
Nero, 95.
Newman, Cardinal, 20.
Newton, Rev. John, 213; on effect of unlimited power, 214.
Northwestern University, 55, 61.

Objections to control, 101.
"Oft-told tale of horrors," 99.
"Open doors" of laboratories, 117.
Opposition to reform, secret of, 227.
Original research, 49.
Ott, Dr. Isaac, experiments of, at Harvard, 123, 124.

Paget, Sir James, 7.
Pain; of vivisection, 28, 29; declared to be "trifling in amount," 163; of inoculations, denied, 198; proven, 199.
Painful demonstrations, 7, 13, 16, 17.
Parker, Sir Peter, 216, 217, 219, 220.
Parrhasius, torture by, 77.
Parvin, Dr. Theophilus, on "damnable cruelties," 100, 117; on nominal anæsthesia, 132.
Pascal, on equivocation, 152.
Patton, Rev. F. L., pres., 60.
Perversion of moral judgments, 226.
Peterborough, Bishop of, 21.

Petitions against reform, 229.
Philadelphia Med. Journal, 251.
Physiologist's idea of "abuse," 108.
Physiology in schools, 85.
Pleasure in cruelty, 193; in experimenting on animals, 9, 94, 170, 194.
Popular Science Monthly, 243.
Porter, Prof. Wm. T., 114; use of *curare* by, 121; challenged as to facts, 119; definition of cruelty, 171.
Princeton University, 54, 60.
Psychopathics, 87, 194.
Puerperal Fever; its alleged infrequency, 176; one of the tragedies of medicine, 176; statistics regarding, 178, 179.

Rabies, research regarding, 129.
Reform of abuses, 51; indifference to, 208.
Reform, some lessons of, 205.
Repugnance to supervision, 65, 230, 232.
Regulation of vivisection, 190, 256.
Richet, Dr. Charles, 67, 92, 99.
Rodney, Lord, his blindness to cruelty, 216, 220.
Roebuck, Hon. J. A., opponent of reform, 225; admits his error, 226.
Rogers, Dr. Henry W., pres. 61.
Rolleston, Dr. G., 8, 9, 95.
Rutherford, Dr., 24, 28.
Royal Commission on vivisection, 7.

Sacrifice of birds, 233.
Salmon, Dr. Daniel E., 172, 197, 230, 246.
Sanarelli, Dr., human vivisections of, 248.
Sanchez, on the art of equivocation, 152, 161, 173.
Schiff, Dr., diabolic humor of, 26.
School physiology, 89.
Schurman, Dr. Jacob G., pres., 62.
Science on origin of animals and man, 77.
Scientific anarchy, 200.
Scientific Association, value of its statements, 179.
Scientific authority, value of, 112, 207.
Scientific curiosity, 75; boundaries of, 186.
Secrecy of vivisection, 46, 117.
Semmelweis; his discovery and reward, 177.
Sexual perversion and torment of animals, 194.
Shaftesbury, Earl of, letters to, 226.
Sharpey, Dr., 5, 8.
Sharpless, Dr. I., pres., 63.
Sight of blood, 96.
Slavery and slave-trade, 209; defended, 215, 216, 218.
Southey, Robert, on child-sacrifice, 224.
Spalanzani, barbarities of, 26.
Spencer, Herbert, 103, 185, 203.
Spinal cord, sensibility of, 137; denied by Surg.-Gen. Sternberg, 138; evidence in favor of, 139-142; experiments upon 10, 28, 49, 129; alleged indifference to absence of, 110.
Stanford University, 56, 62.
Statement in behalf of science, 242.
Sternberg, Surg.-Gen., 135, 137, 139, 141; on inoculations into the eye, 158; other experiments, 159; on painful experimentation, 198, 200.
Stiles, Dr. C. W., 172.

Stricker, Dr., experiments on spinal cord, 57, 67.
Students, Dr. Bigelow's reference to, 49.
Suetonius, 95,
Suppression of truth; Dr. Wilson's condemnation of, 199.
Syphilis, children inoculated with, 187-188.
Syracuse University, 54, 60.

Tait, Dr. Lawson, on vivisection, 42, 174.
Tetanus, 118.
Therapeutic Gazette, on abuses of vivisection, 238, 239.
Thwing, Dr. C. F., 60.
Transcript, Boston, 122, 241, 248, 250.
Truth, "a plain statement of," 114.
Typhoid fever, statements concerning, 146, 148, 149.

University of Chicago, 56, 60.
University of Michigan, 55, 60.
University of Rochester, 55.
Unlimited power, 45, 214.
Unnecessary pain, 21, 75, 100.
Useless vivisection, 17, 51, 100, 115, 150, 194, 253.

Washington, Scientific Societies of, 156, 160, 162, 168.
Watson, Dr. B. A., experiments on dogs, 49, 136; criticisms upon, 136, 137.
Watson, Sir Thomas, 7.
Wesley, Rev. John, 222.
Whitney, Prof. W. F., 114.
Wilberforce, William, 209, 212, 213, 222.
Wilder, Prof. Burt G., 20.
Williams College, 54.
Wilson, Dr. George, pres., on suppression of truth regarding vivisection, 161, 199; on useless experimentation, 150.
Women in coal mines, 228.
Wood, Dr. Horatio R., 24, 236.
Woodward, Dr., 144, 164, 192.

Yale University, 53.
Yeo, Dr. Gerald, 99.

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